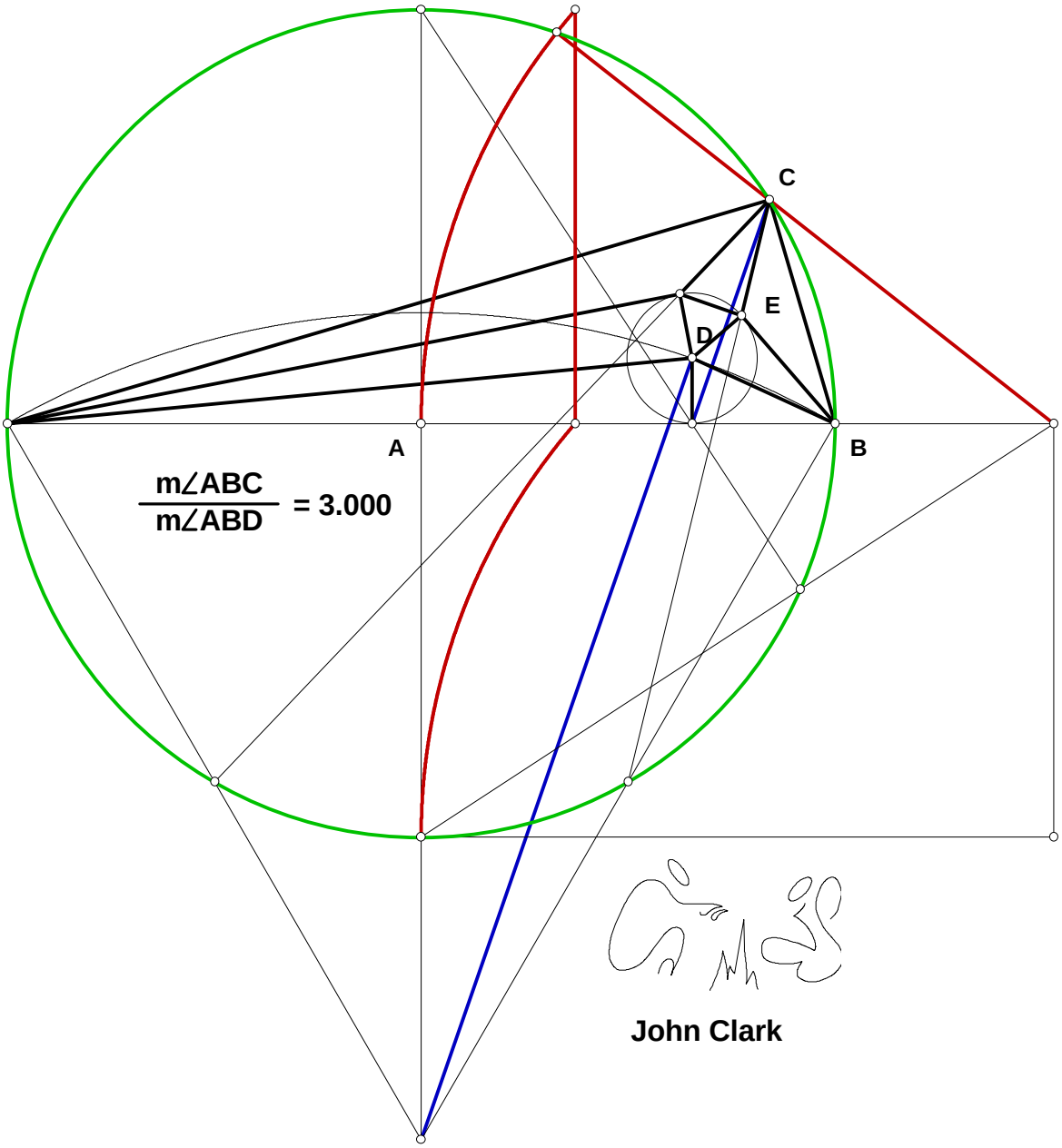
Three Pieces Of Paper



John Clark

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Introduction

Is a novel about the search for a method to divide angles into at least three equal parts. The novel is written in the relatiologic of Geometry and the tautologic of basic Algebra.

I suspect that someday I might have something of significance to write here. J. C.

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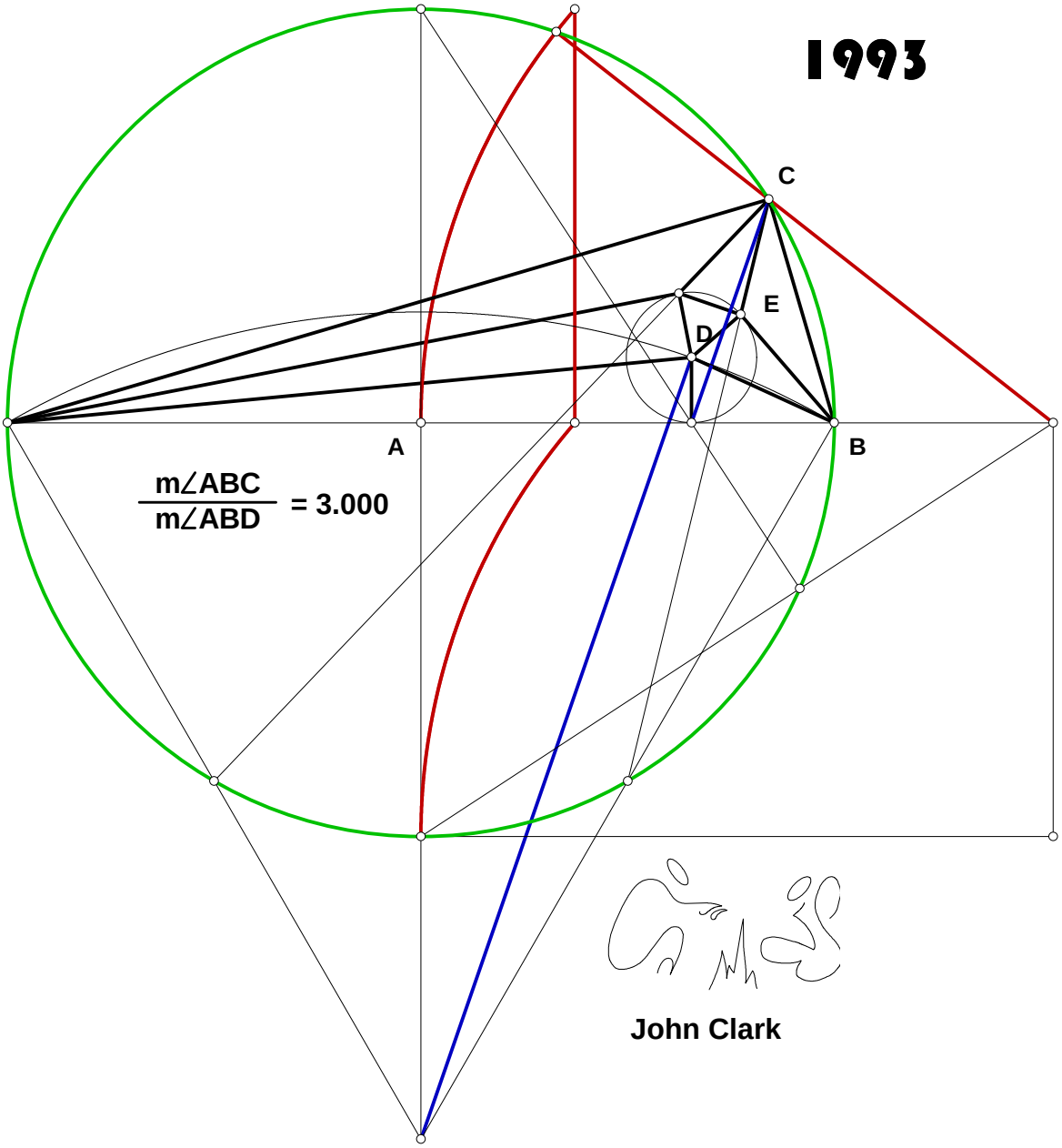
1993



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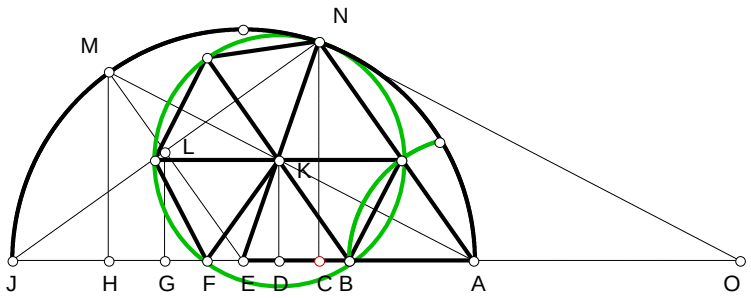
11/11/93 The Archamedian Paper Trisector

If one accepts the facts of the original figure, one only need prove that BK = AB.
If one does not accept the facts, examination of the construction should make it apparent. Does FK = BK = AB?



$N := 4$ $AJ := 1$ $AE := \frac{AJ}{2}$ $EJ := AE$ $EN := AE$ $EM := AE$ $AC := \frac{AJ}{N}$

$CJ := AJ - AC$ $CN := \sqrt{AC \cdot CJ}$ $JN := \sqrt{CN^2 + CJ^2}$ $JL := \frac{JN}{2}$ $GL := \frac{CN}{2}$ $GJ := \frac{CJ}{2}$

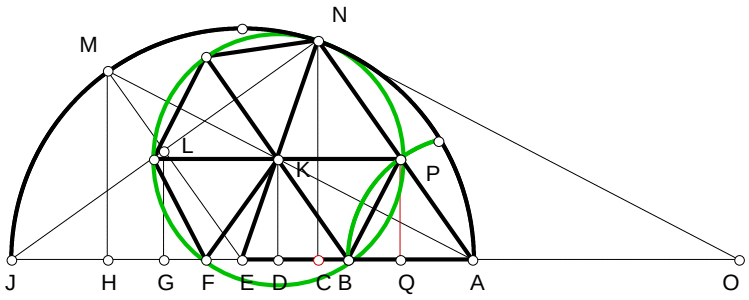
$EG := EJ - GJ$ $EL := \sqrt{EG^2 + GL^2}$ $EH := \frac{EG \cdot EM}{EL}$ $HM := \frac{GL \cdot EM}{EL}$ $AH := AE + EH$

$CO := \frac{AH \cdot CN}{HM}$ $CE := AE - AC$ $EO := CO + CE$ $EK := \frac{EN \cdot AE}{EO}$ $DE := \frac{CE \cdot AE}{EO}$ $DK := \frac{CN \cdot EK}{EN}$

$AD := AE - DE$ $KN := EN - EK$ $BK := KN$ $BD := \sqrt{BK^2 - DK^2}$ $AB := AD - BD$

$AB - BK = 0$ $AB = 0.25$

If PK is parallel to AJ, then . . . .



$AN := 2 \cdot EL$ $AP := AB$ $PQ := \frac{CN \cdot AP}{AN}$ $PQ - DK = 0$

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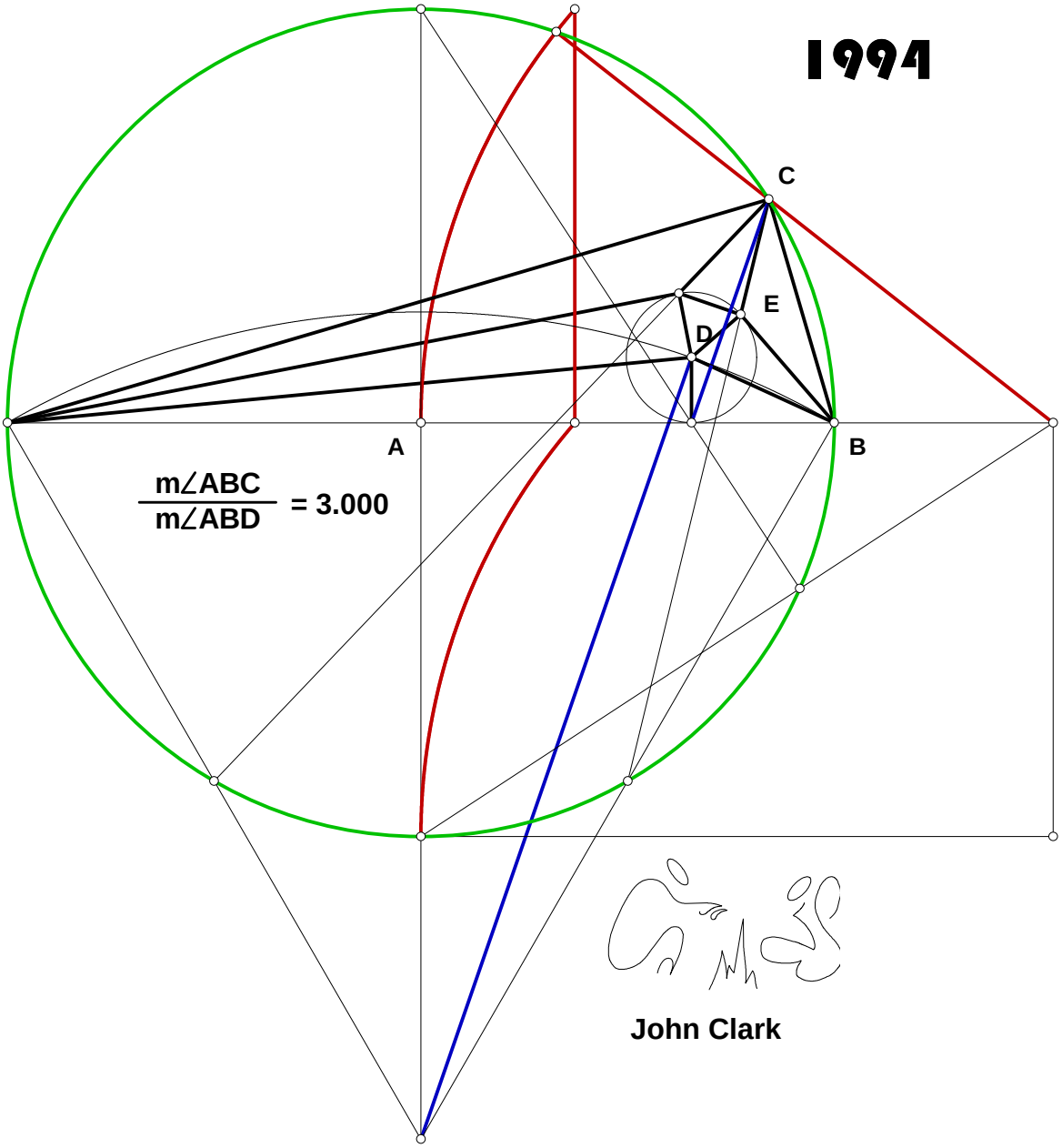
1994



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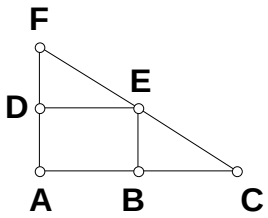
042994

Given AB, AF, BE, what is EF?



$N_1 := 2 \quad N_2 := 3 \quad N_3 := 5 \quad AF := N_1 \quad BE := N_2 \quad AB := N_3$

$AD := BE \quad DE := AB \quad DF := AF - AD \quad EF := \left(DF^2 + DE^2\right)^{\frac{1}{2}}$

$EF - \sqrt{N_1^2 - 2 \cdot N_1 \cdot N_2 + N_2^2 + N_3^2} = 0$

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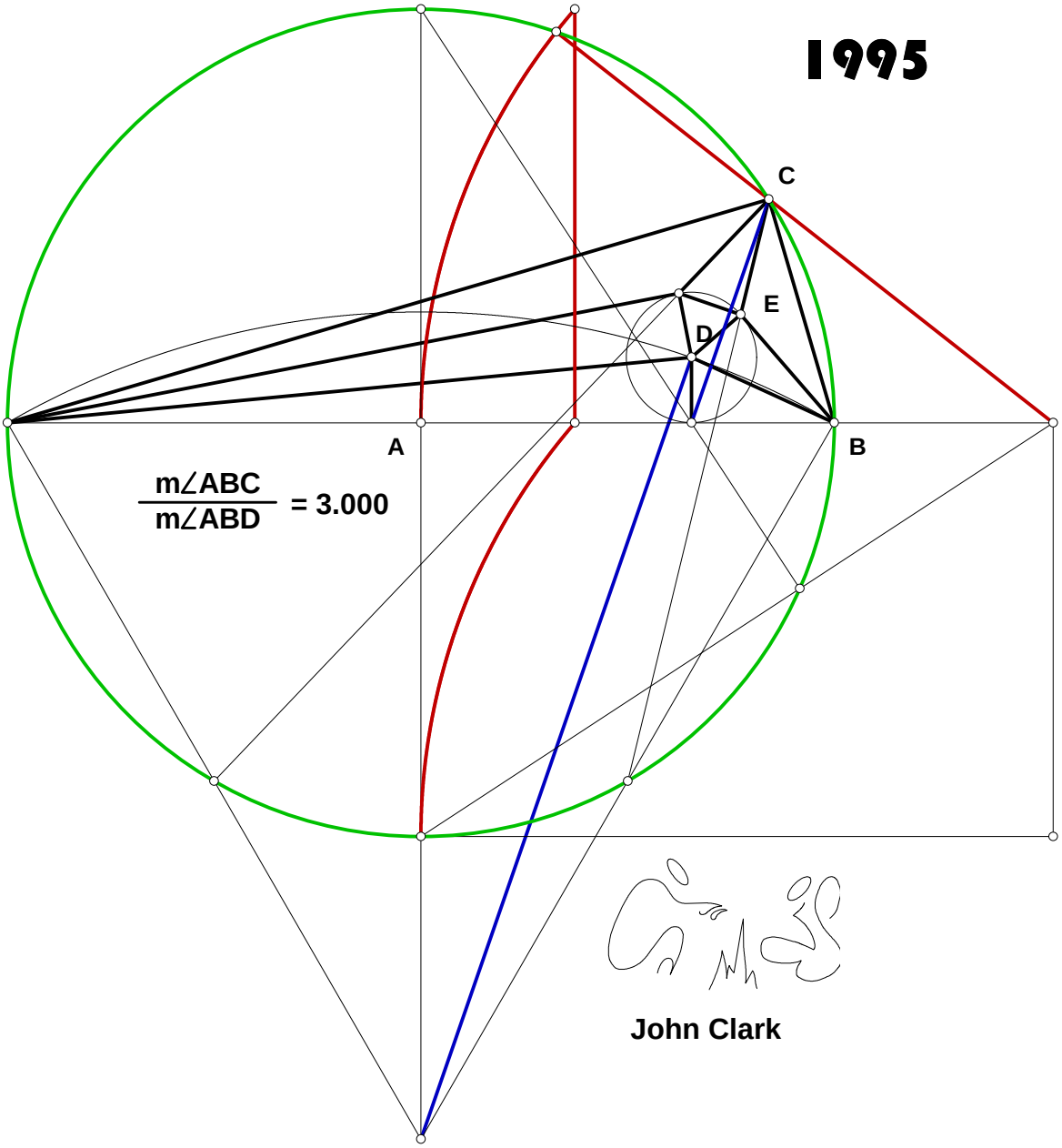
1995



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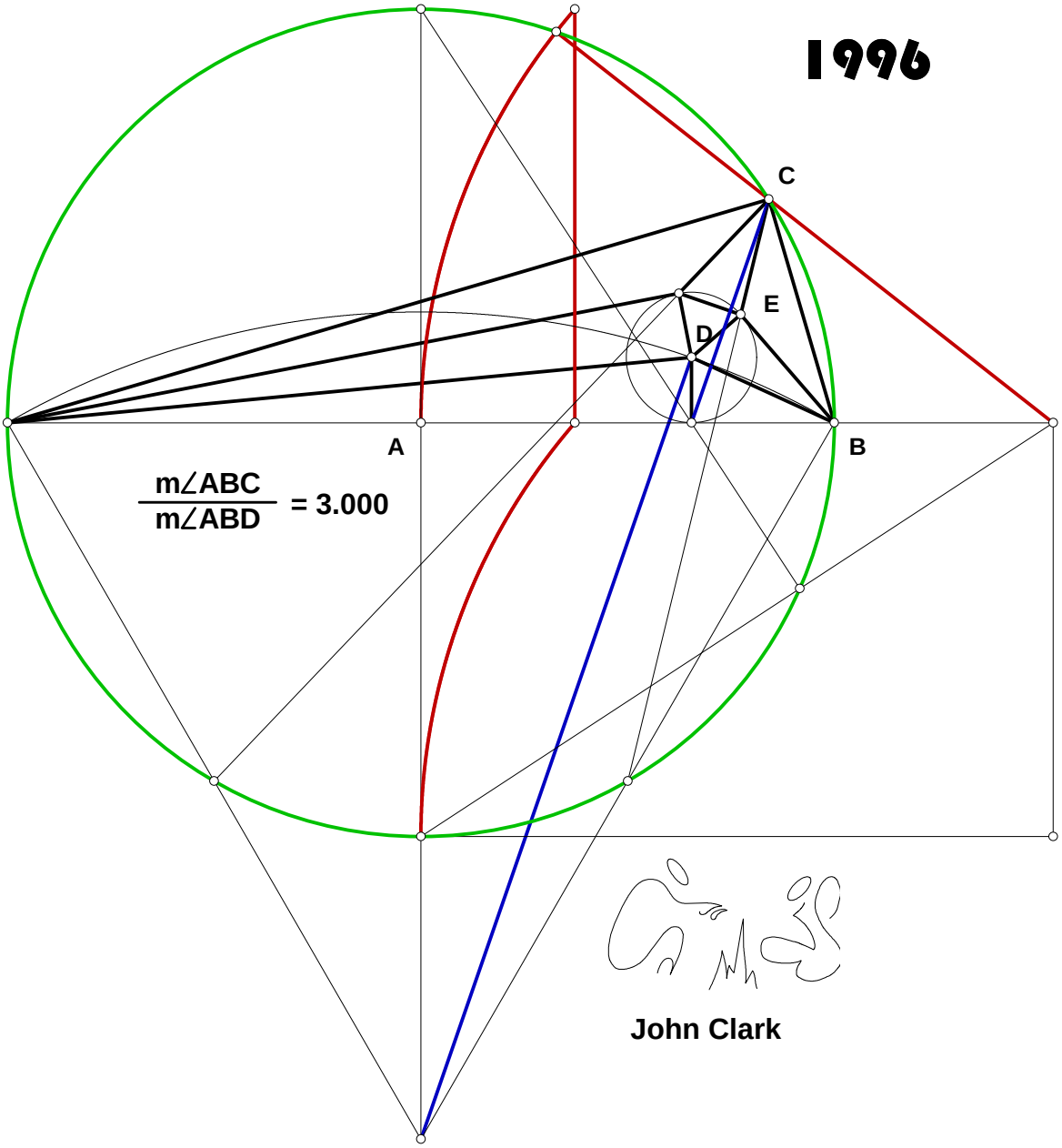
1996



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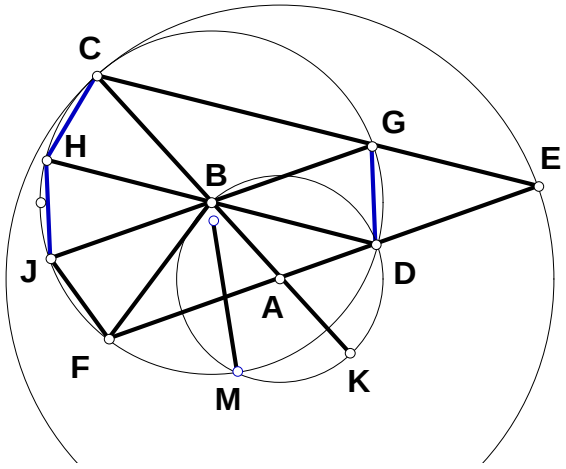
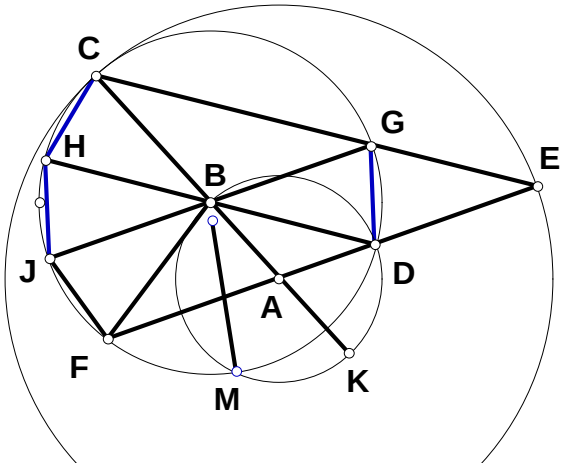
010496 The Archamedian Paper Trisector- Without the Numbers.



Given any circle AB.
Given any circle BC such that BC ≤ 2AB.
Construct AE such that AE = AC.
As AC = AB + BC
and AD = AB so too DE = BC.
Construct DH parallel to BD.
Construct CE.
As AB = AD and AC = AE,
Δ ABD is proportional to Δ ACE,
therefore CE is parallel to BD.
From here one can take two paths.
Construct GJ parallel to EF.
As CE is parallel to DH,
DG = CH.
As GJ is parallel to EF,
DG = FJ.

As ∠ HBJ is opposite
and equal to ∠ GBD,
DG = HJ,
therefore ∠ DG is $\frac{1}{3}$ CF.
As CE is parallel to DH
and EF is parallel to GJ,
EGBD is equilateral.
By construction DK = KM.
As DH is parallel to CE,
CH = DG.
As DK is equal and opposite CH,
MK + DK + DG is $\frac{1}{3}$ DG.



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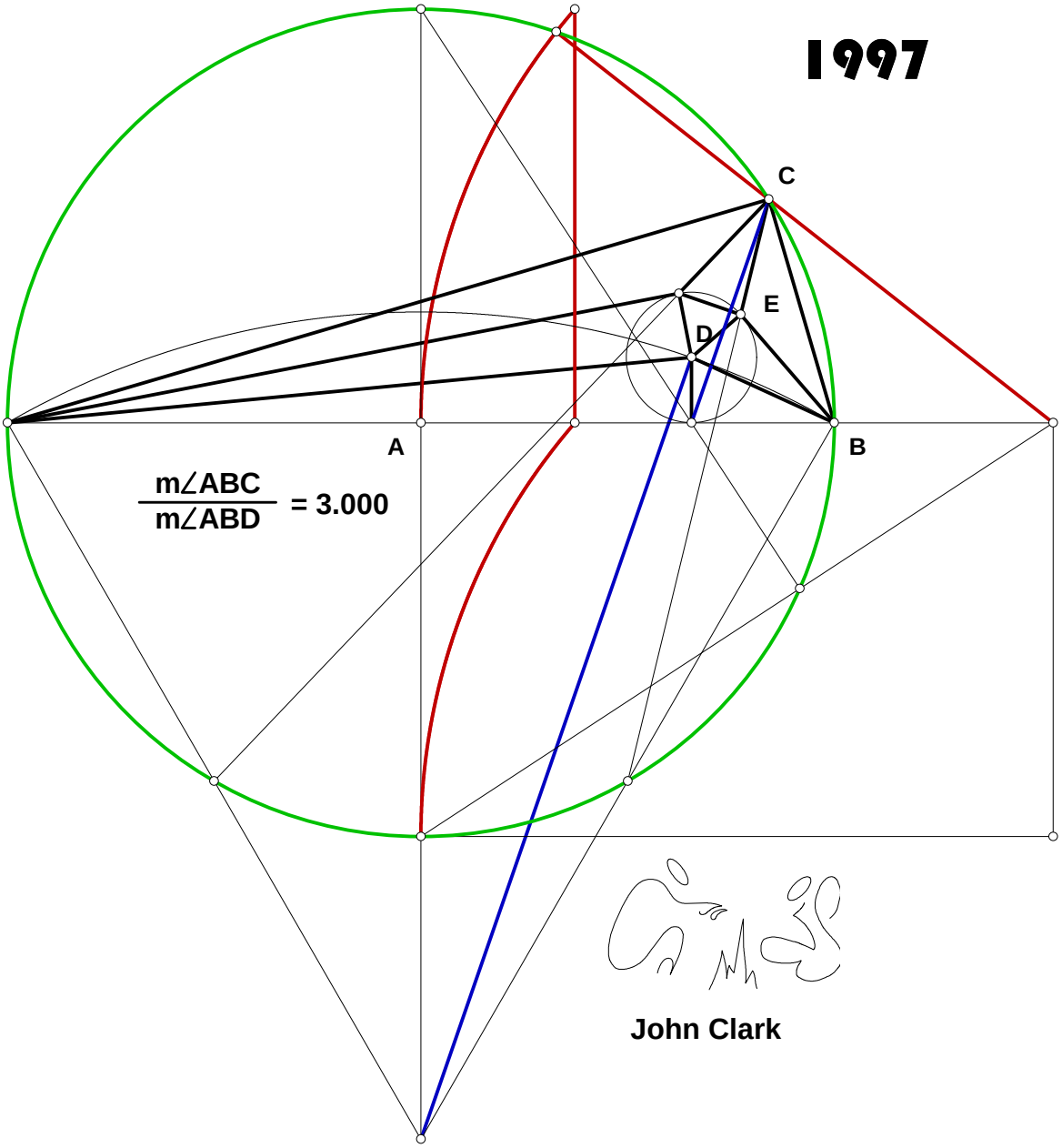
1997



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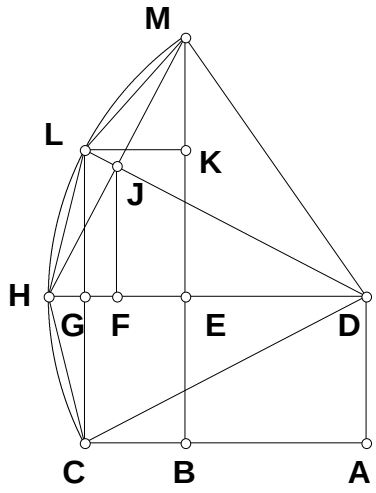
042897



$N := 1.458 \quad AD := 1 \quad AC := AD \cdot N \quad N := N$

$CD := \sqrt{AD^2 + AC^2} \quad DH := CD$

$CG := AD \quad DG := AC \quad GH := DH - DG \quad CH := \sqrt{GH^2 + CG^2}$

$HJ := CG \quad DJ := DG$

$FH := \frac{\left(HJ^2 + DH^2\right) - DJ^2}{2 \cdot DH} \quad EF := FH \quad DE := DH - (EF + FH)$

$AB := DE \quad EG := DG - DE \quad LM := CH \quad LK := EG$

$KM := \sqrt{LM^2 - LK^2} \quad BE := AD \quad BK := 2 \cdot BE \quad BM := BK + KM$

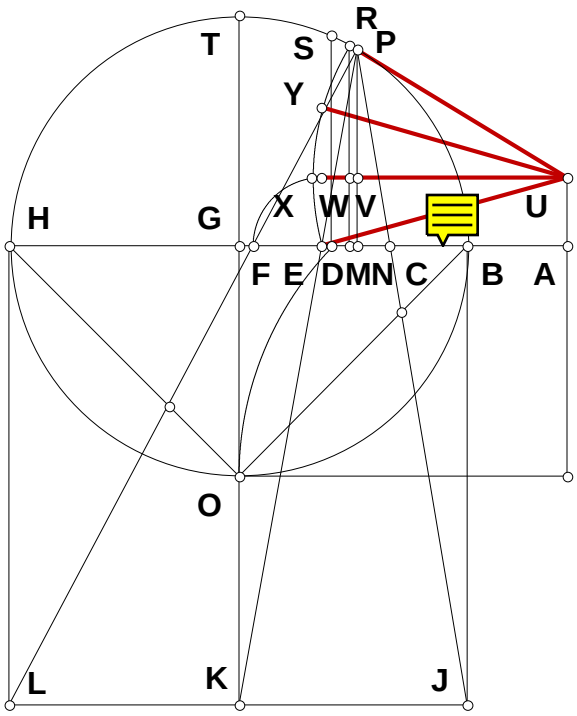
Some Algebraic Names:

$\sqrt{N^2 + 1} - CD = 0 \quad N - AC = 0 \quad \sqrt{N^2 + 1} - N - GH = 0 \quad \sqrt{2 \cdot N^2 - 2 \cdot \sqrt{N^2 + 1} \cdot N + 2} - CH = 0$

$\frac{1}{\sqrt{N^2 + 1}} - FH = 0 \quad \frac{(N - 1) \cdot (N + 1)}{\sqrt{N^2 + 1}} - AB = 0 \quad 2 + \sqrt{\frac{5 \cdot N^2}{N^2 + 1} - \frac{4 \cdot N}{\sqrt{N^2 + 1}} + \frac{1}{N^2 + 1}} - BM = 0$

Trisection and the Cube Roots 042997

If trisection can be placed at RUE, then PV is proportional to RW.



$N := 5 \qquad AB := 1 \qquad AH := AB \cdot N$

$BH := AH - AB \quad BJ := BH$

$AC := \left(AB^2 \cdot AH\right)^{\frac{1}{3}} \qquad AF := \left(AB \cdot AH^2\right)^{\frac{1}{3}}$

$CF := AF - AC \qquad CE := \frac{CF}{2}$

$AE := AC + CE$

$AU := CE \quad NV := AU \quad MW := AU$

(For the next two equations see 042897.)

$$AM := \frac{\left(\frac{AE}{AU} - 1\right) \cdot \left(\frac{AE}{AU} + 1\right) \cdot AU}{\sqrt{\left(\frac{AE}{AU}\right)^2 + 1}}$$

$$MR := 2 \cdot AU + AU \cdot \sqrt{\frac{5 \cdot \left(\frac{AE}{AU}\right)^2}{\left(\frac{AE}{AU}\right)^2 + 1} - \frac{4 \cdot \frac{AE}{AU}}{\sqrt{\left(\frac{AE}{AU}\right)^2 + 1}} + \frac{1}{\left(\frac{AE}{AU}\right)^2 + 1}} \qquad RW := MR - MW$$

$BC := AC - AB \qquad FH := AH - AF \qquad CN := \frac{BC \cdot CF}{BC + FH} \qquad NP := \frac{BJ \cdot CN}{BC} \qquad PV := NP - NV$

$AN := AC + CN \qquad UV := AN \quad UW := AM \qquad \frac{RW \cdot UV}{UW} - PV = 0$

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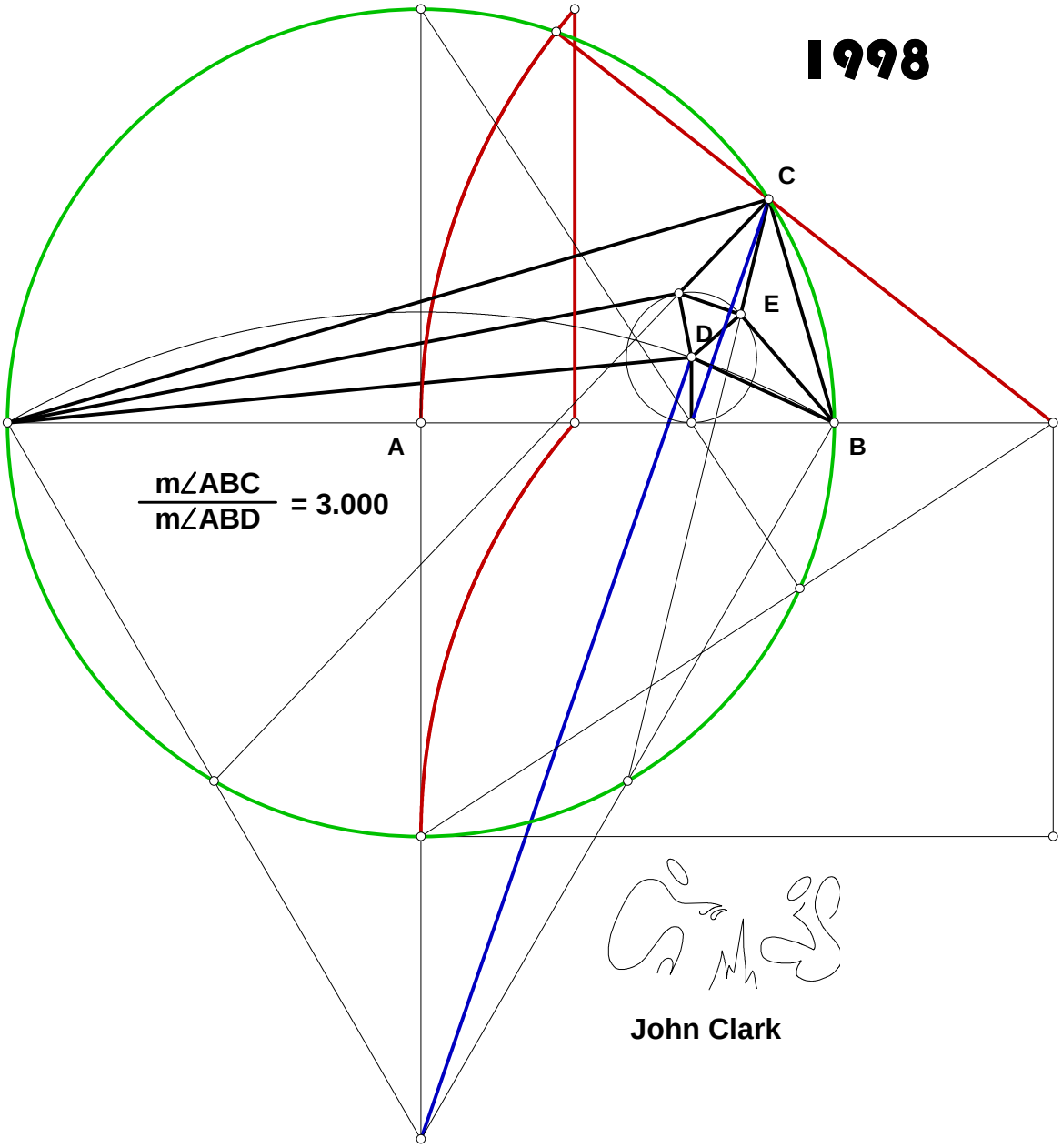
1998



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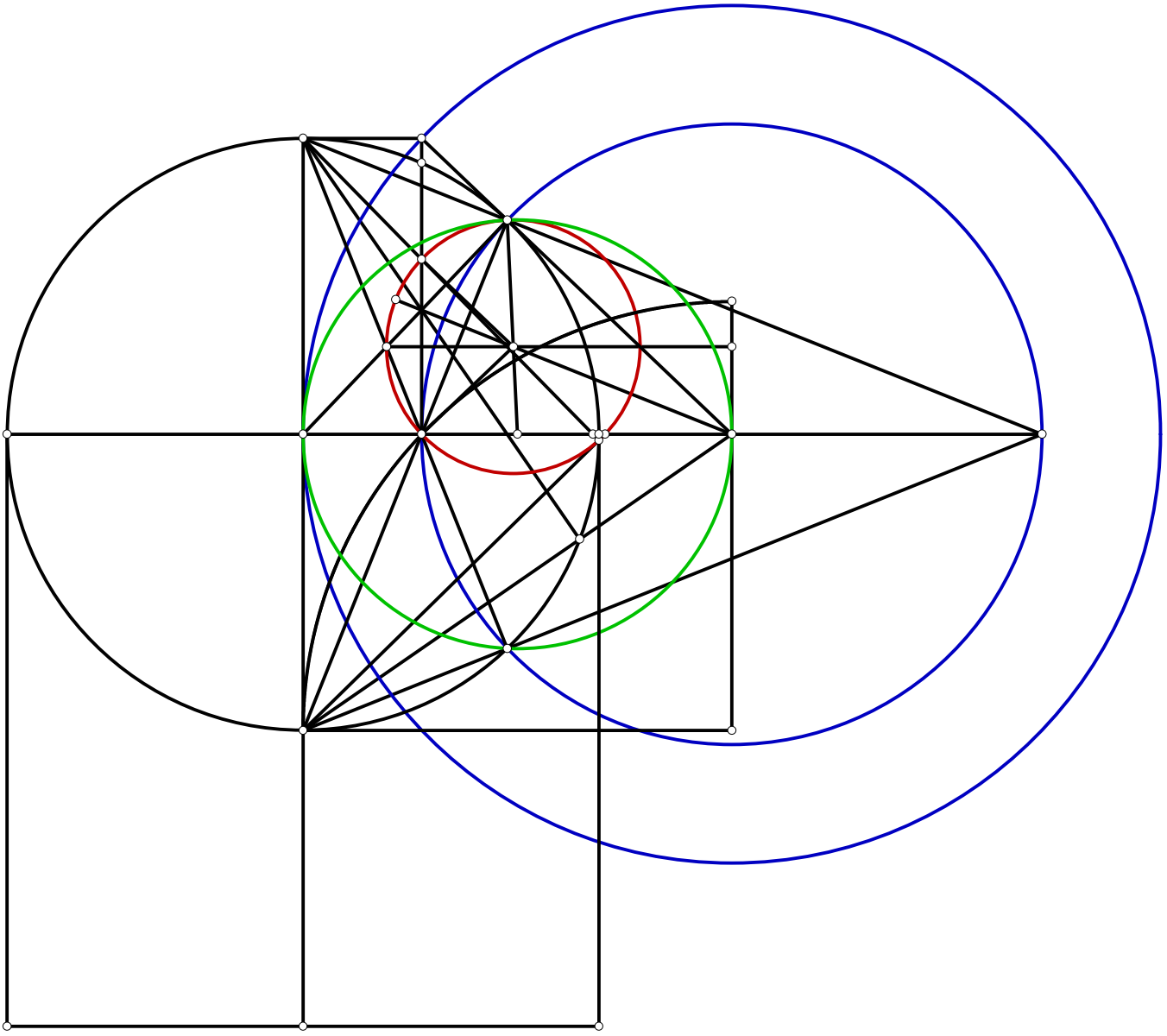
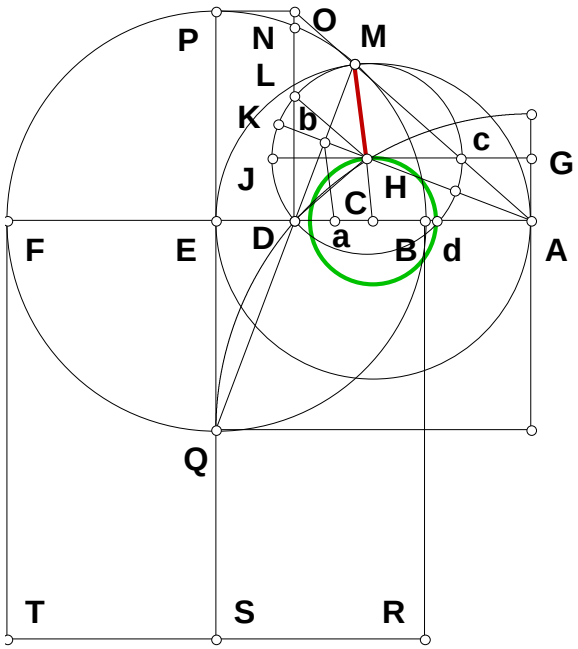


A Square Root Figure And Triseciton 042398

In this square root figure, what is the radius of the circle with the trisected angle? What is the radius CH?



$N := 5 \quad AB := 1 \quad AF := AB \cdot N \quad BF := AF - AB$

$AD := (AB \cdot AF)^{\frac{1}{2}} \quad BE := \frac{BF}{2} \quad BD := AD - AB$

$DE := BE - BD \quad EQ := BE \quad DQ := \left(DE^2 + EQ^2\right)^{\frac{1}{2}}$

$PQ := BF \quad QM := \frac{EQ \cdot PQ}{DQ} \quad DM := QM - DQ$

$AE := AB + BE \quad AC := \frac{AE}{2} \quad Db := \frac{DM}{2}$

$CM := AC \quad ab := \frac{CM \cdot Db}{DM} \quad CD := AD - AC$

$Ca := \frac{CD}{2} \quad Aa := AC + Ca \quad CH := \frac{ab \cdot AC}{Aa}$

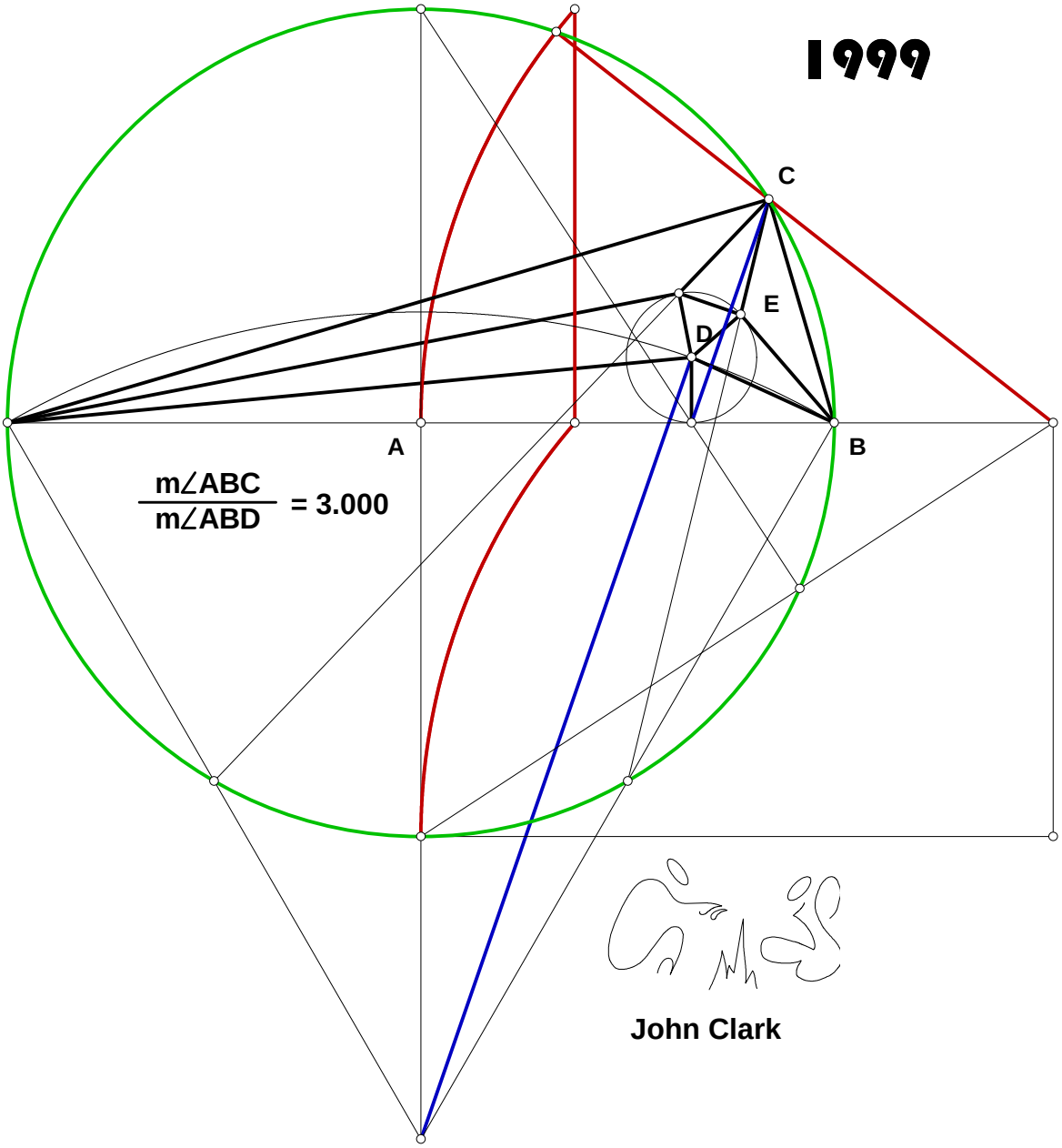
$AM := AD \quad Ac := \frac{AM \cdot CH}{CM} \quad HM := CM - CH$

$HM - Ac = 0$

$$HM - AB \cdot \frac{\sqrt{N} \cdot (N + 1)}{N + 4 \cdot \sqrt{N} + 1} = 0 \qquad CH - AB \cdot \frac{(N + 1)^2}{4 \cdot N + 16 \cdot \sqrt{N} + 4} = 0$$

Three Pieces Of Paper

1999



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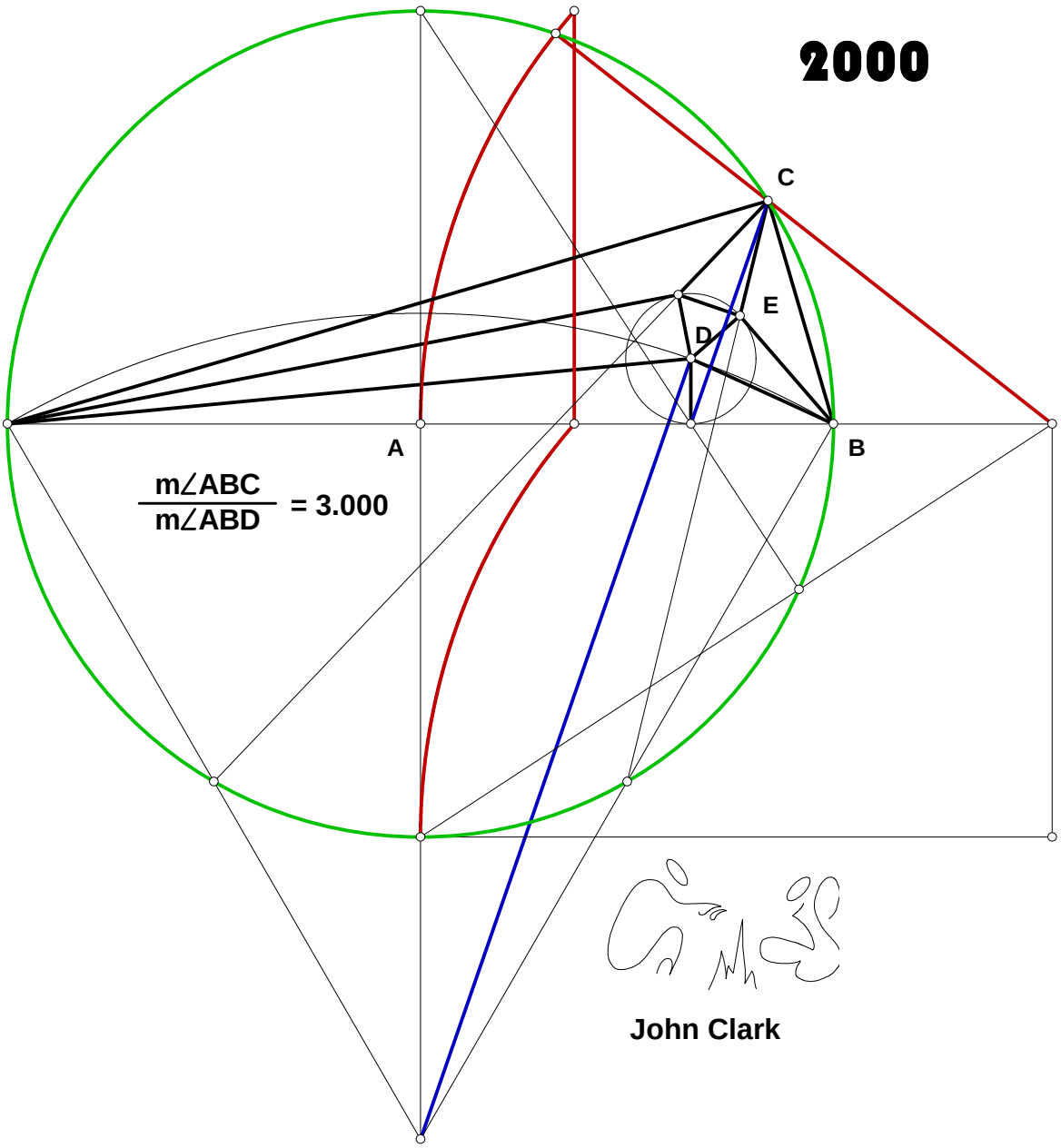

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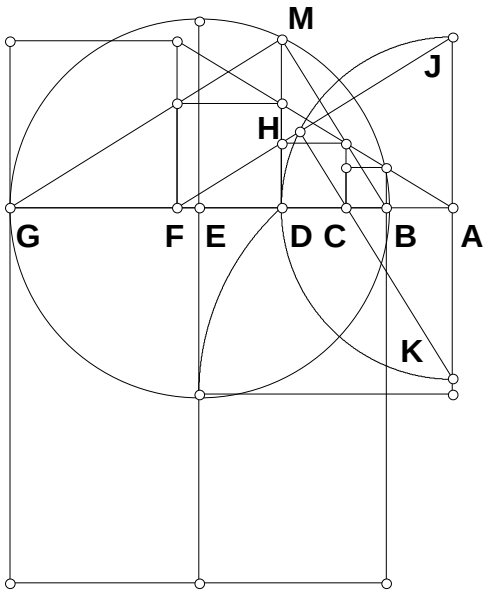
07/09/00 Alternate Method Quad Roots



$N := 3 \quad AB := 1 \quad AG := AB \cdot N \quad AD := \sqrt{AB \cdot AG}$

$BD := AD - AB \quad BG := AG - AB$

$DG := BG - BD \quad DM := \sqrt{BD \cdot DG}$

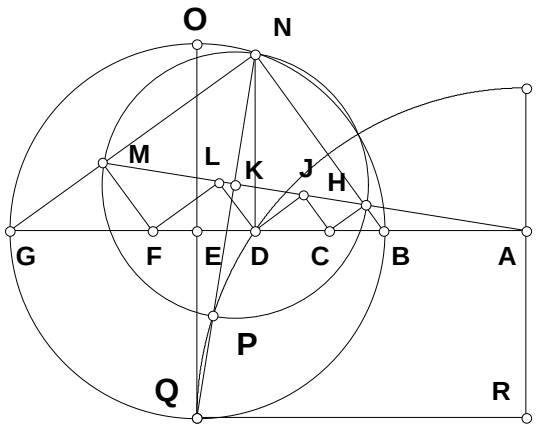
$AJ := AD \quad AK := AD \quad BM := \sqrt{BD^2 + DM^2}$

$GM := \sqrt{DG^2 + DM^2} \quad AF := \frac{GM \cdot AJ}{BM}$

$AC := \frac{BM \cdot AK}{GM}$

$\left(AB \cdot AG^3\right)^{\frac{1}{4}} - AF = 0 \quad \left(AB^3 \cdot AG\right)^{\frac{1}{4}} - AC = 0$

08/01/00 Alternate Method Quad Roots



$N := 5 \qquad AB := 1 \qquad AG := AB \cdot N$

$BG := AG - AB \qquad BE := \frac{BG}{2} \qquad AD := \sqrt{AB \cdot AG}$

$AE := AB + BE \qquad DE := AE - AD \qquad NY := DE$

$BD := AD - AB \qquad DG := BG - BD \qquad EQ := BE$

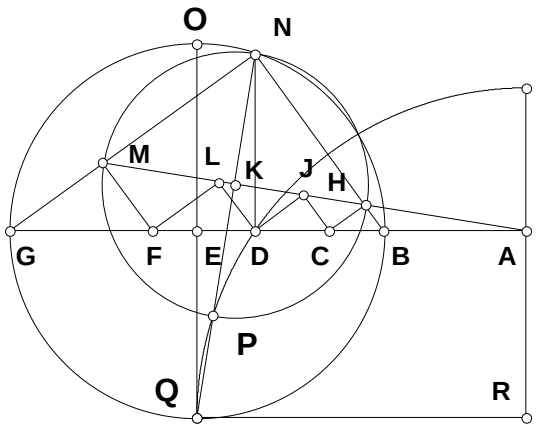
$DN := \sqrt{BD \cdot DG} \qquad NQ := \sqrt{DE^2 + (DN + EQ)^2}$

$QR := AE \qquad OQ := BG \qquad NO := \sqrt{OQ^2 - NQ^2}$

$PQ := \frac{NO \cdot 2 \cdot QR}{OQ} \qquad NP := NQ - PQ \qquad MN := \sqrt{\frac{NP^2}{2}} \qquad BN := \sqrt{BD^2 + DN^2} \qquad GN := \sqrt{DG^2 + DN^2}$

$GM := GN - MN \qquad FG := \frac{BG \cdot GM}{GN} \qquad AF := AG - FG \qquad \left(AB \cdot AG^3\right)^{\frac{1}{4}} - AF = 0$

08/01/00B Alternate Method Quad Roots



$N := 5 \qquad AB := 1 \qquad AG := AB \cdot N$

$BG := AG - AB \qquad BE := \frac{BG}{2} \qquad AD := \sqrt{AB \cdot AG}$

$BD := AD - AB \qquad DG := BG - BD \qquad EQ := BE$

$DN := \sqrt{BD \cdot DG} \qquad BN := \sqrt{BD^2 + DN^2}$

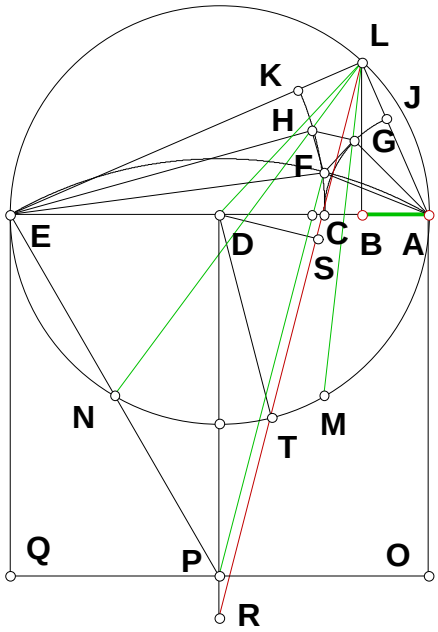
$GN := \sqrt{DG^2 + DN^2} \qquad DE := BE - BD$

$NQ := \sqrt{(DN + EQ)^2 + DE^2} \qquad AN := \sqrt{AD^2 + DN^2} \qquad AE := AB + BE \qquad AQ := \sqrt{AE^2 + EQ^2}$

$KN := \frac{NQ^2 + AN^2 - AQ^2}{2 \cdot NQ} \qquad KM := KN \qquad MN := \sqrt{KN^2 + KM^2} \qquad GM := GN - MN \qquad GF := \frac{BG \cdot GM}{GN}$

$AF := AG - GF \qquad \left(AB \cdot AG^3\right)^{\frac{1}{4}} - AF = 0$

In Trisection What Is AB? 08/02/00



In the trisection figure given and given AC as the Unit what is AB?

$AC := 1 \quad N := 5 \quad AE := AC \cdot N \quad AD := \frac{AE}{2}$

$EP := AE \quad DE := AD \quad DP := \sqrt{EP^2 - DE^2} \quad FP := EP$

$CE := AE - AC \quad CD := CE - DE \quad CF := \sqrt{FP^2 - CD^2} - DP$

$PR := CF \quad DR := DP + PR \quad CR := \sqrt{CD^2 + DR^2}$

$CS := \frac{CD^2}{CR} \quad DS := \sqrt{CD^2 - CS^2} \quad DL := AD$

$LS := \sqrt{DL^2 - DS^2} \quad RS := CR - CS \quad LR := RS + LS$

$BD := \frac{CD \cdot LR}{CR} \quad AB := AD - BD \quad ST := LS \quad RT := RS - ST$

In trisection the length RT to the similarity point is equal to the radius of the circle.

$RT - \frac{N}{2} = 0 \quad AE := N \quad AD := \frac{N}{2}$

$DP := \frac{1}{2} \cdot \sqrt{3} \cdot \sqrt{N^2} \quad CE := N - 1 \quad CD := \frac{1}{2} \cdot N - 1 \quad CF := \frac{1}{2} \cdot \sqrt{(3 \cdot N - 2) \cdot (N + 2)} - \frac{1}{2} \cdot \sqrt{3} \cdot \sqrt{N^2}$

$DR := \frac{1}{2} \cdot \sqrt{(3 \cdot N - 2) \cdot (N + 2)} \quad N - CR = 0 \quad CS := \frac{1}{4} \cdot \frac{(N - 2)^2}{N} \quad LS := \frac{1}{4} \cdot \frac{\left(N^2 + 4 \cdot N - 4\right)}{N}$

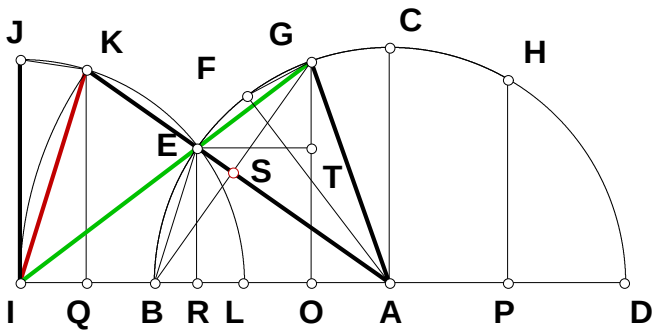
$DS := \frac{1}{4} \cdot \frac{\sqrt{(3 \cdot N - 2) \cdot (N - 2)^2 \cdot (N + 2)}}{N} \quad RS := \frac{1}{4} \cdot (3 \cdot N - 2) \cdot \frac{(N + 2)}{N} \quad LR := \frac{1}{N} \cdot \left(N^2 + 2 \cdot N - 2\right)$

$BD := \frac{1}{2} \cdot (N - 2) \cdot \frac{\left(N^2 + 2 \cdot N - 2\right)}{N^2} \quad \frac{(3 \cdot N - 2)}{N^2} - AB = 0 \quad AB \cdot N^2 - 3 \cdot N + 2 = 0$

If the ratio of AB to N is given, such as N/AB = X, then the Unit AC can be found from a cubic equation.

$X := 4 \quad \frac{\left[\left[-X + \sqrt{-X^2 \cdot (X - 1)}\right]^{\left(\frac{2}{3}\right)} + X\right]}{\left[-X + \sqrt{-X^2 \cdot (X - 1)}\right]^{\left(\frac{1}{3}\right)}} = 3.064$

080300 Trisection



If 2 IQ = EK then 2 JK = EK and the figure projected from BCD will yeild a trisected figure JKL.

$N := 3 \qquad BD := 1$

$AB := \frac{BD}{2} \qquad AD := AB \qquad AP := \frac{AD}{2}$

$BP := AB + AP \qquad BO := \frac{BP}{N} \qquad AE := AB$

$DO := BD - BO \qquad GO := \sqrt{BO \cdot DO}$

$BG := \sqrt{GO^2 + BO^2} \qquad BS := \frac{BG}{2} \qquad ER := BS \qquad TO := ER \qquad GT := GO - TO \qquad AS := \sqrt{AB^2 - BS^2}$

$ES := AE - AS \qquad BR := ES \qquad OR := BO - BR \qquad ET := OR \qquad IO := \frac{ET \cdot GO}{GT} \qquad BI := IO - BO$

$AI := BI + AB \qquad BE := \sqrt{ER^2 + BR^2} \qquad GE := BE \qquad GI := \frac{GE \cdot GO}{GT} \qquad EI := GI - GE \qquad AK := AI \qquad IK := EI$

$IQ := \frac{IK^2 + AI^2 - AK^2}{2 \cdot AI} \qquad EK := AK - AE \qquad \frac{EK}{IQ} = 2$

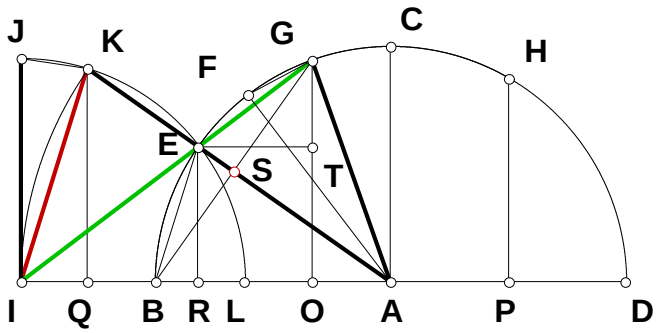
Some Algebraic Names:

$\frac{3}{4 \cdot N} - BO = 0 \qquad 1 - \frac{3}{4 \cdot N} - DO = 0 \qquad \frac{1}{(4 \cdot N)} \cdot \sqrt{3} \cdot \sqrt{4 \cdot N - 3} - GO = 0$

$\frac{1}{2} \cdot \sqrt{3} \cdot \sqrt{\frac{1}{N}} - BG = 0 \qquad \frac{1}{4} \cdot \sqrt{3} \cdot \sqrt{\frac{1}{N}} - BS = 0 \qquad \frac{1}{4} \cdot \frac{\sqrt{3}}{N} \cdot \sqrt{4 \cdot N - 3} - \frac{1}{4} \cdot \sqrt{3} \cdot \sqrt{\frac{1}{N}} - GT = 0$

$\frac{1}{4} \cdot \sqrt{\frac{(4 \cdot N - 3)}{N}} - AS = 0 \qquad \frac{1}{2} - \frac{1}{4} \cdot \sqrt{\frac{(4 \cdot N - 3)}{N}} - ES = 0 \qquad \frac{3}{(4 \cdot N)} - \frac{1}{2} + \frac{1}{4} \cdot \sqrt{4 - \frac{3}{N}} - OR = 0$

$\frac{-1}{4} \cdot \frac{\left[3 \cdot \sqrt{4 \cdot N - 3} \cdot \sqrt{N} - 2 \cdot \sqrt{4 \cdot N - 3} \cdot N^{\left(\frac{3}{2}\right)} + 4 \cdot N^2 - 3 \cdot N\right]}{\left[N^{\left(\frac{3}{2}\right)} \cdot \left(-\sqrt{4 \cdot N - 3} + \sqrt{N}\right)\right]} - IO = 0 \qquad \frac{-1}{2} \cdot \frac{\left(\sqrt{4 \cdot N - 3} - 2 \cdot \sqrt{N}\right)}{\left(\sqrt{4 \cdot N - 3} - \sqrt{N}\right)} - BI = 0$



$$\frac{-1}{\left(-2\cdot\sqrt{4\cdot N-3}+2\cdot\sqrt{N}\right)}\cdot\sqrt{N}-AI=0$$

$$\frac{1}{2}\cdot\sqrt{2-\frac{1}{\sqrt{N}}\cdot\sqrt{4\cdot N-3}}-BE=0$$

$$\frac{1}{2}\cdot\sqrt{\frac{-\left(-2\cdot\sqrt{N}+\sqrt{4\cdot N-3}\right)}{\sqrt{N}}}\cdot\frac{\sqrt{4\cdot N-3}}{\left(\sqrt{4\cdot N-3}-\sqrt{N}\right)}-GI=0$$

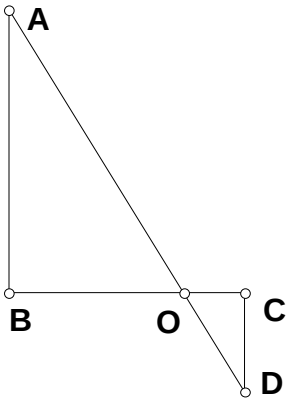
$$\frac{-1}{2}\cdot\sqrt{2-\frac{\sqrt{4\cdot N-3}}{\sqrt{N}}}\cdot\frac{\sqrt{N}}{\left(-\sqrt{4\cdot N-3}+\sqrt{N}\right)}-EI=0$$

$$\frac{1}{4}\cdot\frac{\left(2\cdot\sqrt{N}-\sqrt{4\cdot N-3}\right)}{\left(\sqrt{4\cdot N-3}-\sqrt{N}\right)}-IQ=0$$

$$\frac{1}{2}\cdot\frac{\left(2\cdot\sqrt{N}-\sqrt{4\cdot N-3}\right)}{\left(\sqrt{4\cdot N-3}-\sqrt{N}\right)}-EK=0$$

08/07/00 Proportion Series II

Two unknowns have the same proportion as two givens and the sum of the unknowns are known. Find the two unknowns.



$AB := 9 \qquad CD := 3 \qquad BC := 5$

$BO := \frac{AB \cdot BC}{AB + CD} \qquad CO := \frac{CD \cdot BC}{AB + CD}$

$BO = 3.75 \qquad CO = 1.25$

$BO + CO - BC = 0$

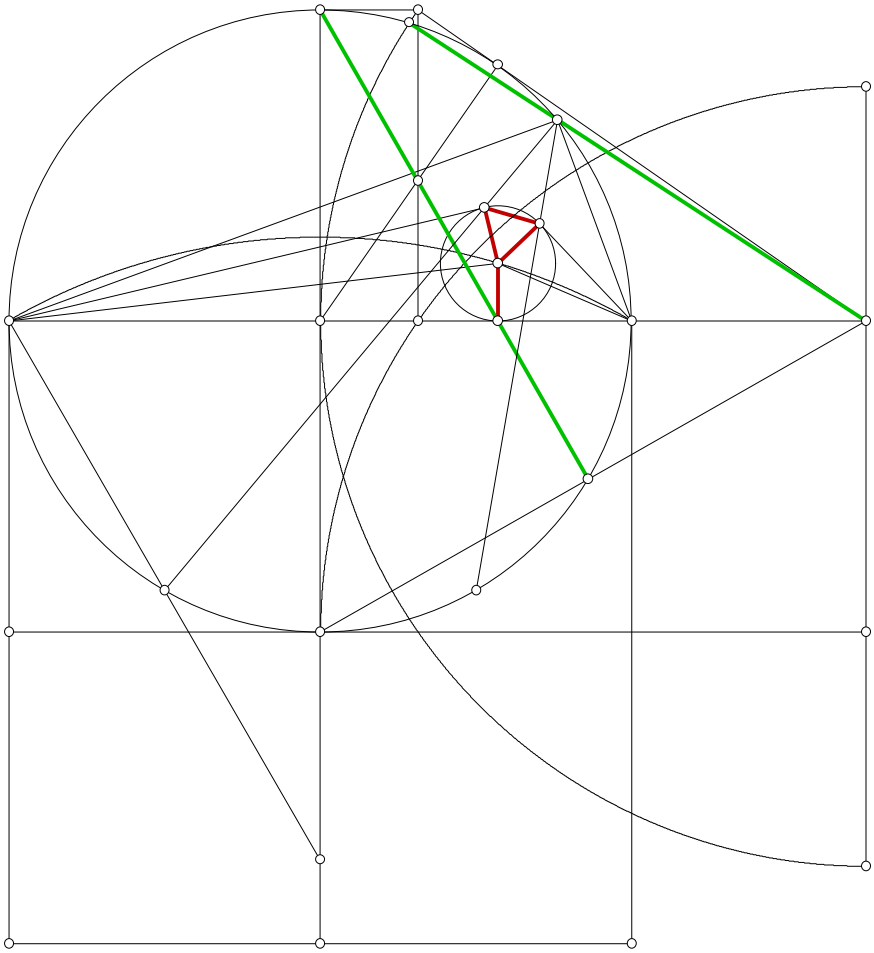
$\frac{AB}{CD} - \frac{BO}{CO} = 0$

m∠UDG = 69.867°

m∠UDCI = 23.289°

$$\frac{m\angle UDG}{m\angle UDCI} = 3.000$$

Trisection and the square root figure.

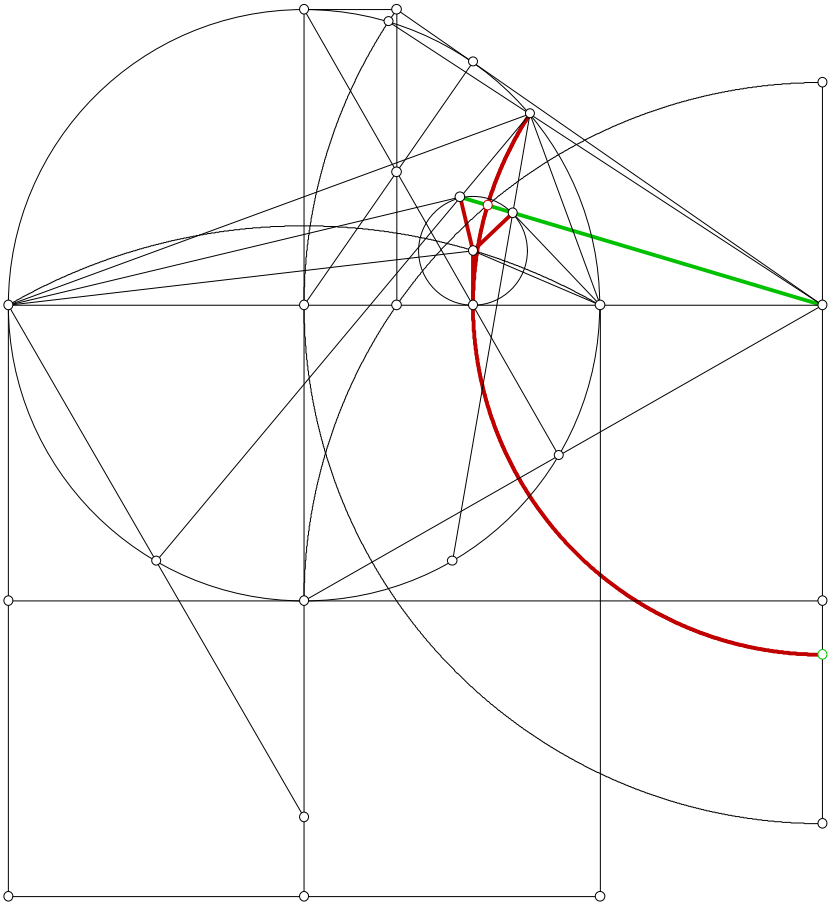


m∠UDG = 69.867°

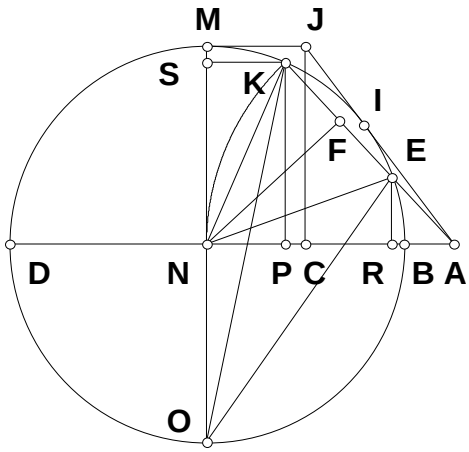
m∠UDCI = 23.289°

$$\frac{m\angle UDG}{m\angle UDCI} = 3.000$$

Trisection and the square root figure.



08/23/00 Trisection In A Square Root Figure



Given the square root figure drawn for trisection, what is AR given AB and AD?

$N := 3 \qquad AB := 1 \qquad AD := AB \cdot N$

$AC := \sqrt{AB \cdot AD} \qquad BD := AD - AB$

$BN := \frac{BD}{2} \qquad KN := BN \qquad CJ := BN$

$AJ := \sqrt{AC^2 + CJ^2} \qquad AK := AJ$

$AN := AB + BN \qquad AP := \frac{AK^2 + AN^2 - KN^2}{2 \cdot AN}$

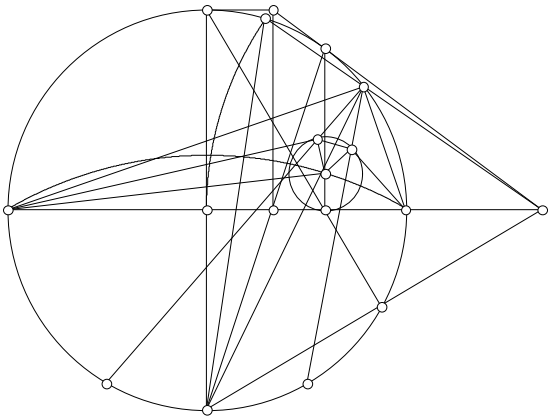
$AF := \frac{AP \cdot AN}{AK} \qquad FK := AK - AF \qquad EF := FK$

$AE := AK - 2 \cdot (EF) \qquad AR := \frac{AP \cdot AE}{AK} \qquad N \cdot \frac{\left(N^2 + 6 \cdot N + 1\right)}{(N+1)^3} - AR = 0 \qquad BR := AR - AB$

$(3 \cdot N + 1) \cdot \frac{(N-1)}{(N+1)^3} - BR = 0$

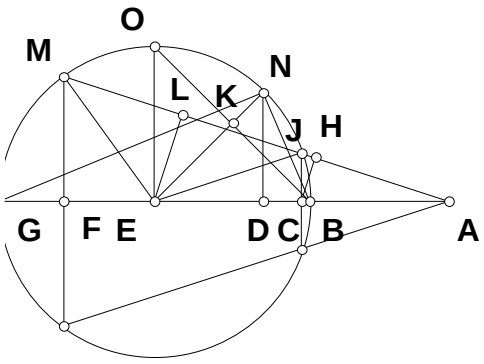
Does KS = FK?

$BP := AP - AB \qquad DP := BD - BP \qquad NP := BN - BP \qquad KS := NP \qquad KS - FK = 0$



09/03/00 Ratios In Trisection

How does BF vary with BC? How does DF vary with BC?



$N_1 := 4 \quad N_2 := 8$

$BG := 1 \quad BE := \frac{BG}{2} \quad EM := BE \quad BO := \sqrt{2 \cdot BE^2}$

$EN := BE \quad EK := \frac{BE \cdot BE}{BO} \quad KN := EN - EK \quad BK := \frac{BO}{2}$

$BN := \sqrt{BK^2 + KN^2} \quad BD := \frac{BN^2}{BG} \quad BC := BD \cdot \frac{N_1}{N_2}$

$CG := BG - BC \quad CJ := \sqrt{BC \cdot CG} \quad AJ := BE$

$AC := \sqrt{AJ^2 - CJ^2} \quad AB := AC - BC \quad AE := AB + BE$

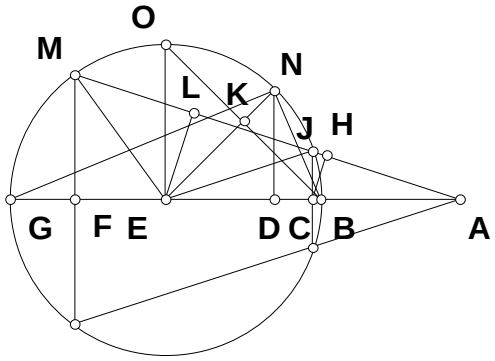
$JH := \frac{CJ^2}{AJ} \quad AH := AJ - JH \quad AL := \frac{AH \cdot AE}{AC} \quad JL := AL - AJ$

$LM := JL \quad AM := AL + LM \quad AF := \frac{AH \cdot AM}{AC} \quad BF := AF - AB$

$$\frac{-1}{4} \cdot \left(-2 + \sqrt{2}\right) \cdot \frac{N_1}{N_2} - BC = 0$$

$$BF - \frac{1}{8} \cdot \left(7 \cdot \sqrt{2} - 10\right) \cdot \left(N_1 - 4 \cdot N_2 - 2 \cdot N_2 \cdot \sqrt{2}\right) \cdot \frac{\left(2 \cdot N_1 - 2 \cdot N_2 - N_2 \cdot \sqrt{2}\right)^2}{N_2^3} = 0$$

$$\frac{1}{2} \cdot \frac{\left(2 \cdot N_1 - 2 \cdot N_2 - N_2 \cdot \sqrt{2}\right)^2 \cdot \left[\left(2 \cdot \sqrt{2} - 3\right) \cdot \left(N_1 - 4 \cdot N_2 - 2 \cdot N_2 \cdot \sqrt{2}\right)\right]}{\left(N_2^2 \cdot N_1\right)} - \frac{BF}{BC} = 0$$

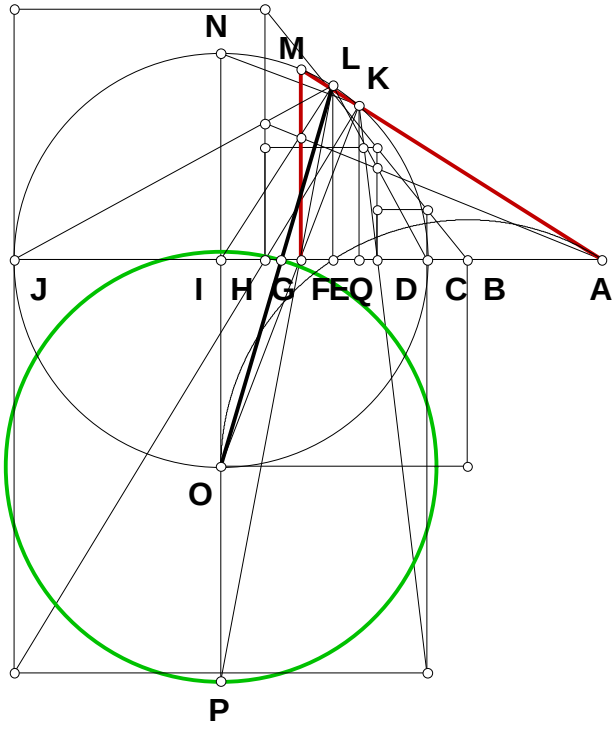


$$DF := BF - BD$$

$$\frac{\left(N_1 - N_2\right)\cdot\left[\left(7\cdot\sqrt{2} - 10\right)\cdot\left(12\cdot\sqrt{2}\cdot N_2^{\,2} + 17\cdot N_2^{\,2} + 2\cdot N_1^{\,2} - 10\cdot N_1\cdot N_2 - 6\cdot N_1\cdot\sqrt{2}\cdot N_2\right)\right]}{4\,N_2^{\,3}} - DF = 0$$

$$\frac{\left(N_1 - N_2\right)\cdot\left[\left(2\cdot\sqrt{2} - 3\right)\cdot\left(2\cdot N_1^{\,2} - 10\cdot N_1\cdot N_2 - 6\cdot N_1\cdot\sqrt{2}\cdot N_2 + 17\cdot N_2^{\,2} + 12\cdot\sqrt{2}\cdot N_2^{\,2}\right)\right]}{N_1\cdot N_2^{\,2}} - \frac{DF}{BC} = 0$$

Goshdarn Good Pencil 09/16/00



$N := 2$

$BC := 1 \quad BJ := BC \cdot N \quad BE := \sqrt{BC \cdot BJ}$

$CJ := BJ - BC \quad CI := \frac{CJ}{2} \quad IO := CI$

$NO := CJ \quad CR := CJ$

$CE := BE - BC \quad EI := CI - CE \quad EJ := CJ - CE$

$EL := \sqrt{CE \cdot EJ} \quad EG := \frac{EI \cdot EL}{EL + IO} \quad GI := EI - EG$

$GO := \sqrt{GI^2 + IO^2} \quad OP := GO$

$IP := IO + OP \quad EF := \frac{EI \cdot EL}{EL + IP} \quad FI := EI - EF$

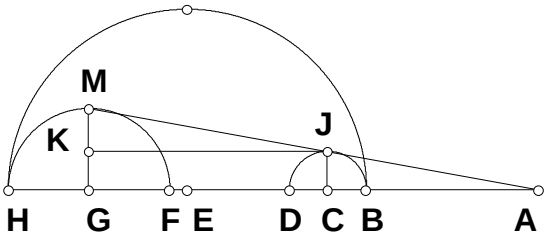
$FO := \sqrt{FI^2 + IO^2} \quad OK := \frac{IO \cdot NO}{FO}$

$FK := OK - FO \quad FQ := \frac{FI \cdot FK}{FO} \quad QI := FQ + FI \quad CQ := CI - QI \quad QJ := CJ - CQ \quad QK := \sqrt{CQ \cdot QJ}$

$CD := \frac{CQ \cdot CR}{CR + QK} \quad BD := CD + BC \quad \left(BC^2 \cdot BJ\right)^{\frac{1}{3}} - BD = 0.000004486957912$

Midpoints and Similarity Points 09/18/00

What is AE given the radius of the two circles and the difference between their centers? (External Unit).



$N_1 := 2 \quad N_2 := 3 \quad N_3 := 8$

$BC := N_1 \quad GH := N_2 \quad CG := N_3$

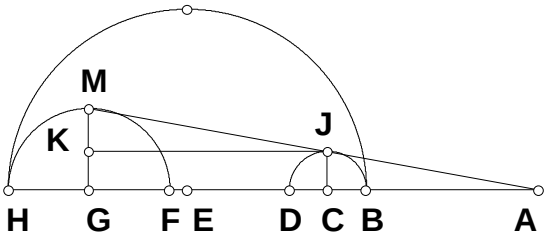
$CJ := BC \quad GM := GH \quad GK := CJ$

$BH := BC + CG + GH \quad BE := \frac{BH}{2}$

$KM := GM - GK \quad JK := CG \quad AG := \frac{JK \cdot GM}{KM} \quad AH := AG + GH \quad AB := AH - BH \quad AE := AB + BE$

$$AE - \frac{N_3 \cdot N_2 - 2 \cdot N_1 \cdot N_2 + N_1^2 + N_3 \cdot N_1 + N_2^2}{2 \cdot (N_2 - N_1)} = 0$$

What is AE if given the difference between their extremes and the radius given as a ratio of that segment? (Internal Unit).



$N_1 := 3 \quad N_2 := 7 \quad N_3 := 4 \quad N_4 := 9$

$BH := 1 \quad BE := \frac{BH}{2} \quad BC := BH \cdot \frac{N_1}{N_2}$

$GH := BH \cdot \frac{N_3}{N_4} \quad CG := BH - (BC + GH)$

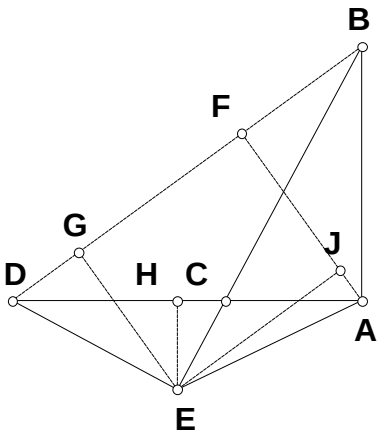
$CJ := BC \quad GM := GH \quad GK := CJ$

$KM := GM - GK \quad JK := CG \quad AG := \frac{JK \cdot GM}{KM} \quad AH := AG + GH \quad AB := AH - BH \quad AE := AB + BE$

$$AE - \frac{(N_3 \cdot N_2 - 4 \cdot N_3 \cdot N_1 + N_1 \cdot N_4)}{2 \cdot (N_3 \cdot N_2 - N_1 \cdot N_4)} = 0$$

11/13/00

Given AB, DE, AD find BE, AC, CD, EC, BC.



$N_1 := 2 \qquad N_2 := 4 \qquad N_3 := 1$

$AB := N_1 \qquad AD := N_2 \qquad DE := N_3$

$BD := \sqrt{AB^2 + AD^2} \qquad BF := \frac{AB^2}{BD} \qquad DG := \frac{DE^2}{BD} \qquad BE := \sqrt{AD^2 - DE^2}$

$AF := \sqrt{AB^2 - BF^2} \qquad EG := \sqrt{DE^2 - DG^2}$

$FG := BD - (BF + DG) \qquad EJ := FG \qquad FJ := EG \qquad AJ := AF - FJ \qquad AE := \sqrt{EJ^2 + AJ^2} \qquad S_1 := AD \qquad S_2 := DE \qquad S_3 := AE$

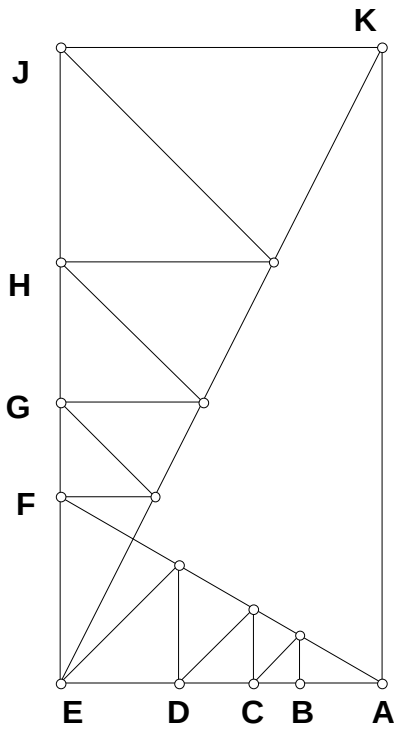
$AH := \frac{S_3^2 + S_1^2 - S_2^2}{2 \cdot S_1} \qquad EH := \sqrt{AE^2 - AH^2} \qquad CH := \frac{EH \cdot AH}{AB + EH} \qquad AC := AH - CH \qquad CE := \frac{AC \cdot DE}{AB} \qquad CD := AD - AC$

$$N_1 \cdot \frac{\left(-N_3^2 \cdot N_2 + N_2^3 + N_1^2 \cdot N_2 - N_1 \cdot \sqrt{N_1^2 + N_2^2 - N_3^2} \cdot N_3\right)}{\left(N_1^3 + N_1 \cdot N_2^2 + N_3 \cdot \sqrt{-N_3^2 \cdot N_2^2 + N_2^4 + N_1^2 \cdot N_2^2 - 2 \cdot N_1 \cdot N_2 \cdot \sqrt{N_1^2 + N_2^2 - N_3^2} \cdot N_3 + N_3^2 \cdot N_1^2}\right)} - AC = 0$$

$$N_3 \cdot \frac{\left(-N_3^2 \cdot N_2 + N_2^3 + N_2 \cdot N_1^2 - N_1 \cdot N_3 \cdot \sqrt{N_1^2 + N_2^2 - N_3^2}\right)}{\left(N_1^3 + N_1 \cdot N_2^2 + N_3 \cdot \sqrt{-N_3^2 \cdot N_2^2 + N_2^4 + N_1^2 \cdot N_2^2 - 2 \cdot N_1 \cdot N_2 \cdot \sqrt{N_1^2 + N_2^2 - N_3^2} \cdot N_3 + N_3^2 \cdot N_1^2}\right)} - CE = 0$$

Means On Means 11/28/00

Modify 02/28/98 for Mean proportionals between E and J.



$AE := 1 \qquad N := 3 \qquad EJ := AE \cdot N \qquad JK := AE$

$HJ := \frac{JK \cdot EJ}{JK + EJ} \qquad EH := EJ - HJ \qquad GH := \frac{EH \cdot HJ}{EH + HJ}$

$EG := EH - GH \qquad FG := \frac{EG \cdot GH}{EG + GH} \qquad EF := EG - FG$

$DE := \frac{EF \cdot AE}{EF + AE} \qquad AD := AE - DE \qquad CD := \frac{AD \cdot DE}{AD + DE}$

$AC := AD - CD \qquad BC := \frac{AC \cdot CD}{AC + CD} \qquad AB := AC - BC$

$M := 0 .. 3 \qquad P := 0 .. 3 \qquad AEAB_{M,P} := \left[\frac{N^{M+1}}{(N+1)^{M}} + 1 \right]^{P}$

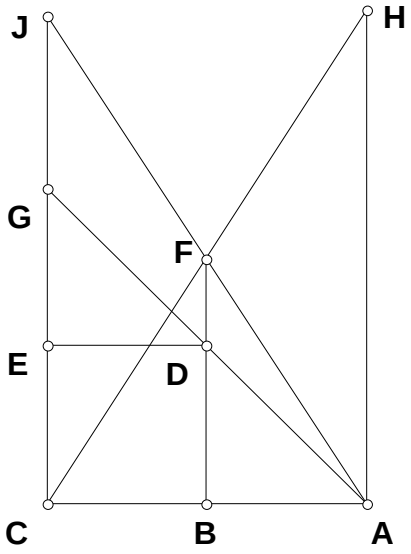
$$AEAB = \begin{bmatrix} 1 & 4 & 16 & 64 \\ 1 & 3.25 & 10.563 & 34.328 \\ 1 & 2.688 & 7.223 & 19.411 \\ 1 & 2.266 & 5.133 & 11.63 \end{bmatrix}$$

$AEAB_{3,3} - \frac{AE}{AB} = 0 \qquad AEAB_{3,2} - \frac{AE}{AC} = 0 \qquad AEAB_{3,1} - \frac{AE}{AD} = 0 \qquad AEAB_{3,0} - \frac{AE}{AE} = 0$

$AEAB_{3,3} - \frac{AE}{AB} = 0$

Multiplication and Division-Line By A Line 11/29/00

Given some unit, and two differences, multiply or divide the one difference by the other.
For Division:



$AC := 1 \qquad N_1 := 3 \qquad N_2 := 12 \qquad AH := N_1$

$CJ := N_2 \qquad AB := \frac{AH}{(CJ + AH)} \cdot AC$

$BC := AC - AB \quad BD := BC \quad CG := \frac{BD \cdot AC}{AB}$

$CG - \frac{N_2}{N_1} = 0 \qquad CG = 4$

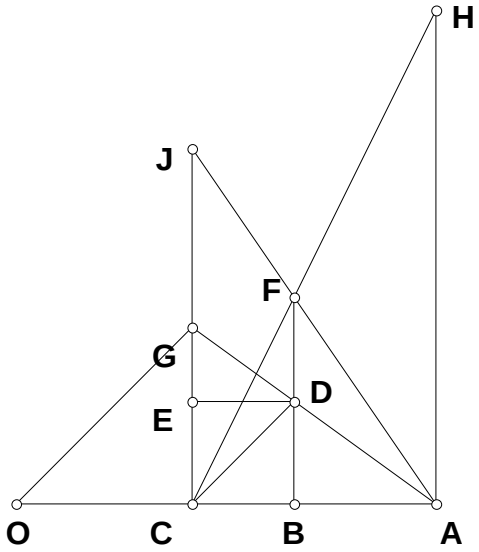
For Multiplication:

$AC := 1 \qquad N_1 := 5 \qquad N_2 := 7 \qquad AH := N_1$

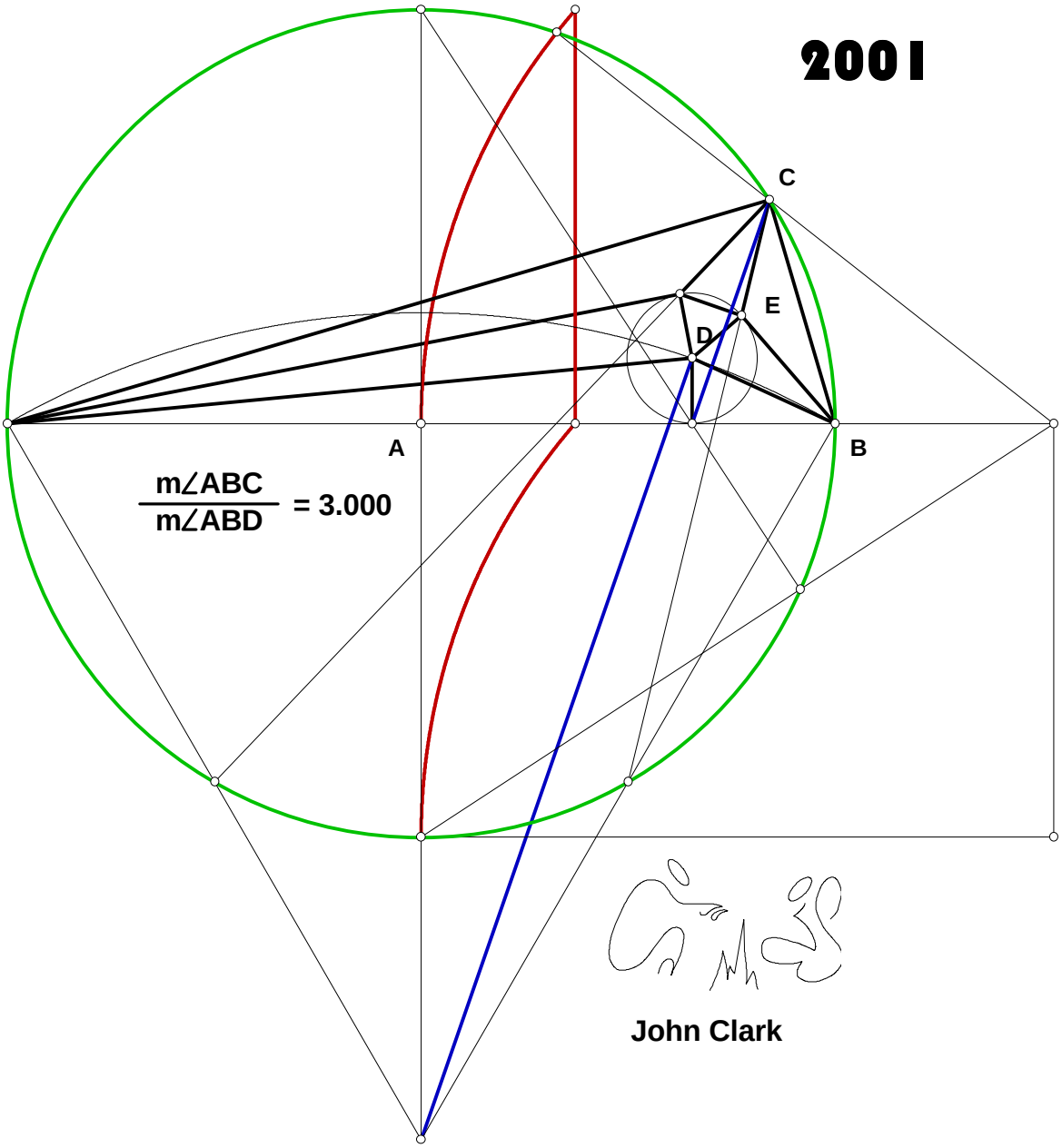
$CG := N_2 \qquad CO := CG \qquad BD := \frac{CG \cdot AC}{AC + CO}$

$BC := BD \qquad AB := AC - BC \qquad BF := \frac{AH \cdot BC}{AC}$

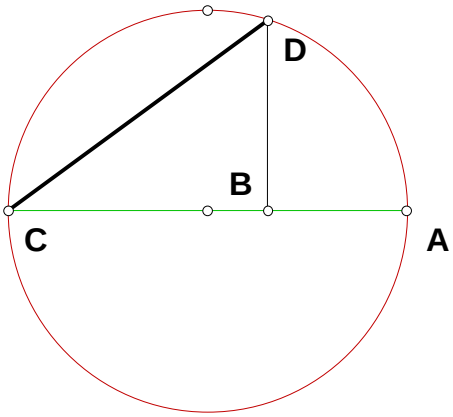
$CJ := BF \cdot \frac{AC}{AB} \qquad CJ - N_1 \cdot N_2 = 0 \qquad CJ = 35$



Three Pieces Of Paper



John Clark



Alternate method for common segment common endpoint square root.

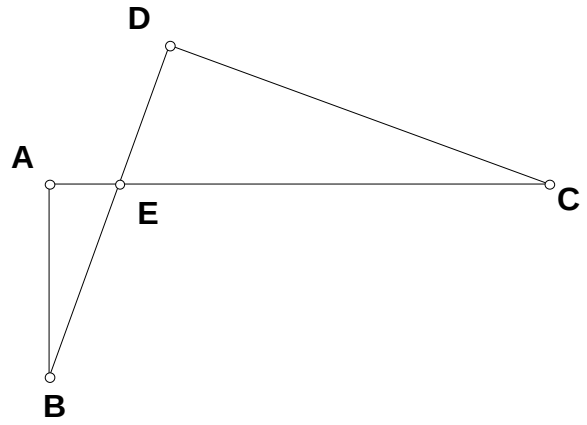
$N_1 := 5 \qquad N_2 := 3 \qquad AC := N_1 \qquad BC := N_2$

$AB := AC - BC \qquad BD := \sqrt{AB \cdot BC} \qquad CD := \sqrt{BD^2 + BC^2}$

$\sqrt{N_2 \cdot N_1} - CD = 0$

Three Given Five Taken 042101

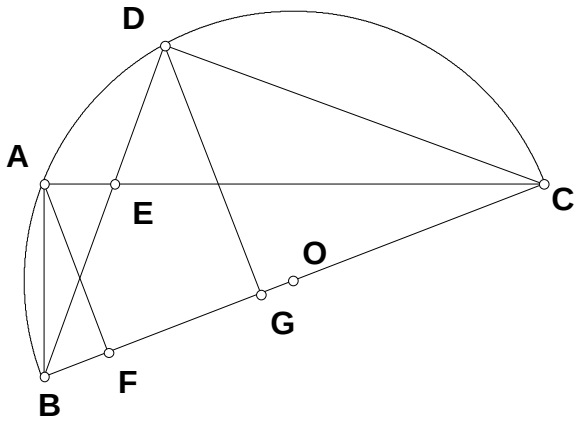
Given AB, CD, AC and that CDB, and BAC are right angles, what are BD, AE, CE, BE, DE?



$N_1 := 2 \qquad N_2 := 3 \qquad N_3 := 4$

$AB := N_1 \quad CD := N_2 \quad AC := N_3$

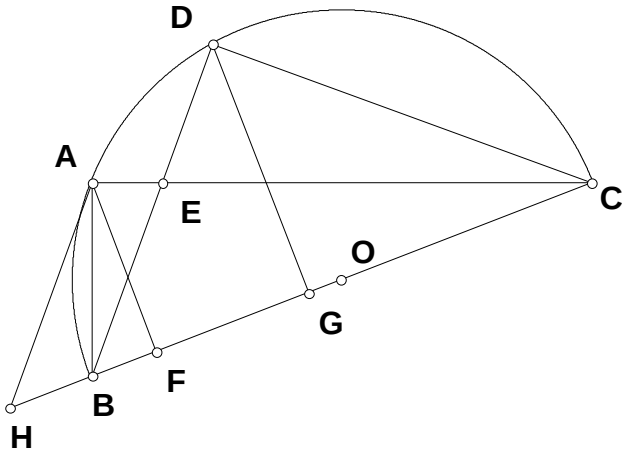
$BC := \sqrt{AB^2 + AC^2} \qquad CG := \frac{CD^2}{BC} \qquad BF := \frac{AB^2}{BC}$



$BG := BC - CG \qquad CF := BC - BF$

$AF := \sqrt{AB^2 - BF^2} \qquad DG := \sqrt{CD^2 - CG^2}$

$FH := \frac{BG \cdot AF}{DG} \qquad CH := CF + FH$



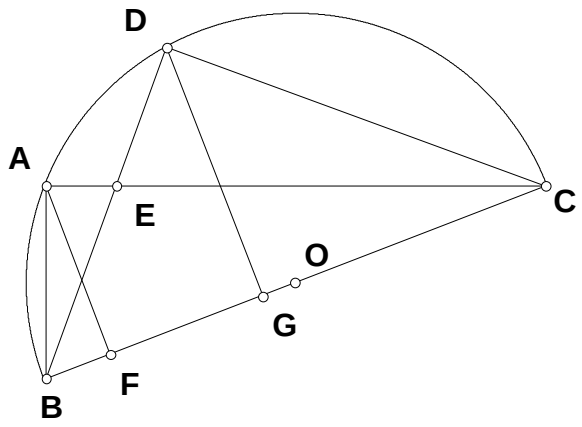
$BD := \sqrt{BG^2 + DG^2}$

$AH := \frac{BD \cdot FH}{BG} \qquad BE := \frac{AH \cdot BC}{CH}$

$DE := BD - BE \qquad CE := \frac{AC \cdot BC}{CH}$

$AE := AC - CE$

Idea about process progression: Given two differences one renders a set number of processes upon them, then one progresses to three?



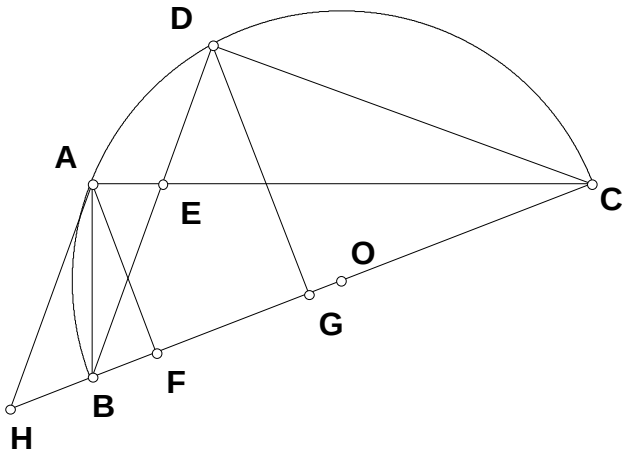
Some Algebraic Names:

$$\sqrt{N_1^2 + N_3^2} - BC = 0 \qquad \frac{N_2^2}{\sqrt{N_1^2 + N_3^2}} - CG = 0$$

$$\frac{N_1^2}{\sqrt{N_1^2 + N_3^2}} - BF = 0$$

$$\frac{\left(N_1^2 + N_3^2 - N_2^2\right)}{\sqrt{N_1^2 + N_3^2}} - BG = 0$$

$$\frac{N_3^2}{\sqrt{N_1^2 + N_3^2}} - CF = 0$$



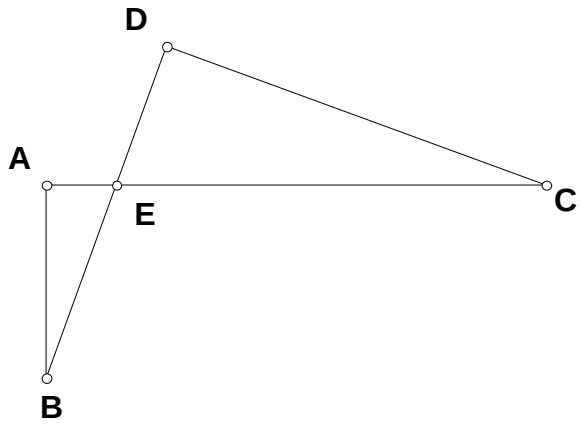
$$\frac{N_1 \cdot N_3}{\sqrt{N_1^2 + N_3^2}} - AF = 0$$

$$N_2 \cdot \sqrt{\frac{\left(N_1^2 + N_3^2 - N_2^2\right)}{\left(N_1^2 + N_3^2\right)}} - DG = 0$$

$$\frac{N_3 \cdot N_1 \cdot \left(N_1^2 + N_3^2 - N_2^2\right)}{N_2 \cdot \sqrt{\left(N_1^2 + N_3^2 - N_2^2\right) \cdot \left(N_1^2 + N_3^2\right)}} - FH = 0$$

$$\left[\frac{N_3^2}{\sqrt{N_1^2 + N_3^2}} + \frac{N_3 \cdot N_1 \cdot \left(N_1^2 + N_3^2 - N_2^2\right)}{N_2 \cdot \sqrt{\left(N_1^2 + N_3^2 - N_2^2\right) \cdot \left(N_1^2 + N_3^2\right)}}\right] - CH = 0 \qquad N_3 \cdot \frac{N_1}{N_2} - AH = 0$$

The Five Sought:



$$\sqrt{N_1^2 + N_3^2 - N_2^2} - BD = 0$$

$$N_2 \cdot \frac{\left(\sqrt{N_1^2 + N_3^2 - N_2^2} \cdot N_3 - N_1 \cdot N_2\right)}{\left(N_3 \cdot N_2 + \sqrt{N_1^2 + N_3^2 - N_2^2} \cdot N_1\right)} - DE = 0$$

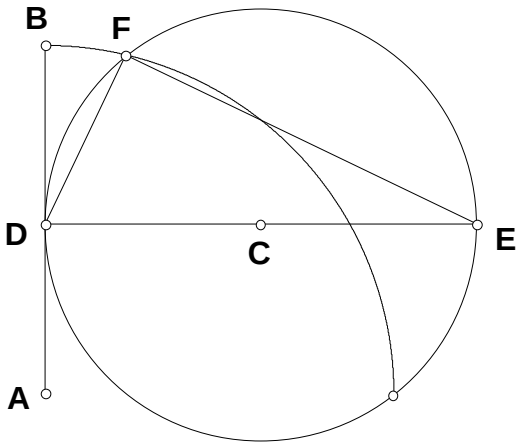
$$N_1 \cdot \frac{\left(N_1^2 + N_3^2\right)}{\left(N_3 \cdot N_2 + \sqrt{N_1^2 + N_3^2 - N_2^2} \cdot N_1\right)} - BE = 0$$

$$\frac{N_2 \cdot \left(N_1^2 + N_3^2\right)}{N_3 \cdot N_2 + \sqrt{N_1^2 + N_3^2 - N_2^2} \cdot N_1} - CE = 0$$

$$N_3 - \frac{N_2 \cdot \left(N_1^2 + N_3^2\right)}{\left(N_3 \cdot N_2 + \sqrt{N_1^2 + N_3^2 - N_2^2} \cdot N_1\right)} - AE = 0$$

042201

Given AB as unit, AD and DC, what is EF and DF?



$N_1 := 2.052 \quad N_2 := .62 \quad AB := 1.802$

$AD := \frac{AB}{N_1} \quad CD := AB \cdot N_2 \quad DE := 2\ CD$

$AF := AB \quad CF := CD$

$AC := \sqrt{AD^2 + CD^2} \quad S_1 := AF \quad S_2 := AC \quad S_3 := CF$

$AG := \frac{S_2^2 + S_1^2 - S_3^2}{2 \cdot S_1} \quad CG := \sqrt{AC^2 - AG^2}$

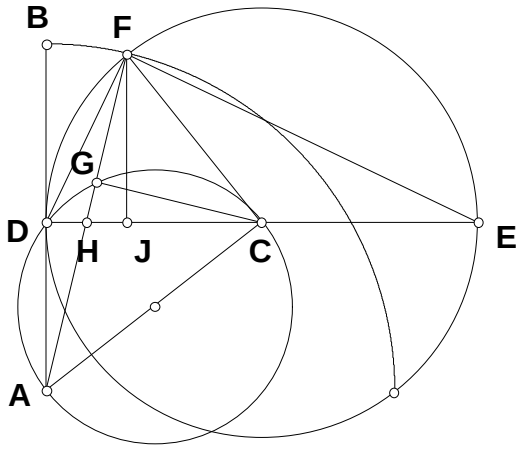
$L_1 := AD \quad L_2 := CG \quad L_3 := CD$

$DH := L_3 - \frac{L_2 \cdot \left(L_1^2 + L_3^2\right)}{L_3 \cdot L_2 + \sqrt{L_1^2 + L_3^2 - L_2^2} \cdot L_1}$

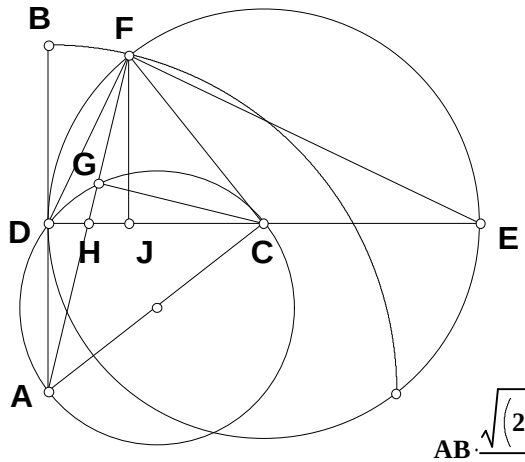
$AH := L_1 \cdot \frac{\left(L_1^2 + L_3^2\right)}{\left(L_3 \cdot L_2 + \sqrt{L_1^2 + L_3^2 - L_2^2} \cdot L_1\right)}$

$FH := AF - AH \quad HJ := \frac{DH \cdot FH}{AH}$

$DJ := DH + HJ \quad EJ := DE - DJ \quad FJ := \frac{AD \cdot FH}{AH} \quad EF := \sqrt{FJ^2 + EJ^2} \quad DF := \sqrt{DJ^2 + FJ^2}$



Some Algebraic Names:



$$\frac{AB}{N_1} - AD = 0 \qquad AB \cdot N_2 - CD = 0$$

$$(2\,AB) \cdot N_2 - DE = 0 \qquad AB \cdot \sqrt{\frac{\left(1 + N_2^{\,2} \cdot N_1^{\,2}\right)}{N_1^{\,2}}} - AC = 0$$

$$\frac{1}{2} \cdot AB \cdot \frac{\left(1 + N_1^{\,2}\right)}{N_1^{\,2}} - AG = 0$$

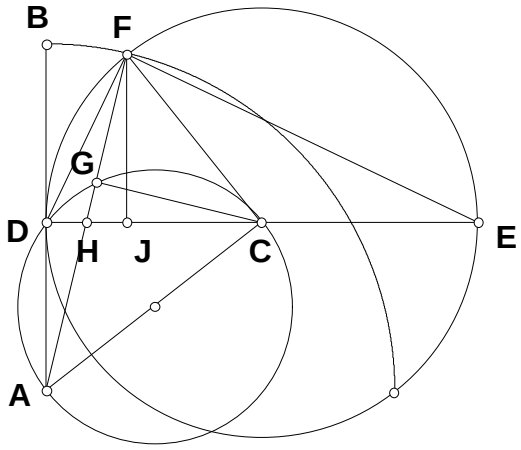
$$AB \cdot \frac{\sqrt{\left(2 \cdot N_1^{\,2} \cdot N_2 + N_1^{\,2} - 1\right) \cdot \left(2 \cdot N_1^{\,2} \cdot N_2 - N_1^{\,2} + 1\right)}}{2 \cdot N_1^{\,2}} - CG = 0$$

$$AB \cdot \frac{N_2 \cdot N_1^{\,3} + N_2 \cdot N_1 - \sqrt{2 \cdot N_1^{\,2} + 4 \cdot N_1^{\,4} \cdot N_2^{\,2} - 1 - N_1^{\,4}}}{N_1^{\,3} + N_1^{\,2} \cdot N_2 \cdot \sqrt{2 \cdot N_1^{\,2} + 4 \cdot N_1^{\,4} \cdot N_2^{\,2} - 1 - N_1^{\,4}} + N_1} - DH = 0$$

$$2 \cdot AB \cdot \frac{\left(1 + N_2^{\,2} \cdot N_1^{\,2}\right)}{\left(N_1 \cdot N_2 \cdot \sqrt{2 \cdot N_1^{\,2} + 4 \cdot N_1^{\,4} \cdot N_2^{\,2} - 1 - N_1^{\,4}} + 1 + N_1^{\,2}\right)} - AH = 0$$

$$AB - 2 \cdot AB \cdot \frac{\left(1 + N_2^{\,2} \cdot N_1^{\,2}\right)}{\left(N_1 \cdot N_2 \cdot \sqrt{2 \cdot N_1^{\,2} + 4 \cdot N_1^{\,4} \cdot N_2^{\,2} - 1 - N_1^{\,4}} + 1 + N_1^{\,2}\right)} - FH = 0$$

$$\frac{-1}{2} \cdot AB \cdot \frac{\begin{bmatrix} -N_1^{\,4} \cdot N_2^{\,2} \cdot \sqrt{2 \cdot N_1^{\,2} + 4 \cdot N_1^{\,4} \cdot N_2^{\,2} - 1 - N_1^{\,4}} \ldots \\ + 2 \cdot N_1^{\,3} \cdot N_2 - 2 \cdot N_1^{\,5} \cdot N_2 \ldots \\ + 6 \cdot N_1^{\,5} \cdot N_2^{\,3} - 3 \cdot N_2^{\,2} \cdot N_1^{\,2} \cdot \sqrt{2 \cdot N_1^{\,2} + 4 \cdot N_1^{\,4} \cdot N_2^{\,2} - 1 - N_1^{\,4}} \ldots \\ + 2 \cdot N_2^{\,3} \cdot N_1^{\,3} - \sqrt{2 \cdot N_1^{\,2} + 4 \cdot N_1^{\,4} \cdot N_2^{\,2} - 1 - N_1^{\,4}} \ldots \\ + N_1^{\,2} \cdot \sqrt{2 \cdot N_1^{\,2} + 4 \cdot N_1^{\,4} \cdot N_2^{\,2} - 1 - N_1^{\,4}} \end{bmatrix}}{\left[N_1 \cdot \left[\left(N_1 \cdot N_2 \cdot \sqrt{2 \cdot N_1^{\,2} + 4 \cdot N_1^{\,4} \cdot N_2^{\,2} - 1 - N_1^{\,4}} + 1 + N_1^{\,2}\right) \cdot \left(1 + N_2^{\,2} \cdot N_1^{\,2}\right)\right]\right]} - HJ = 0$$



$$\frac{1}{2}\cdot AB\cdot\frac{\left(N_1{}^3\cdot N_2+N_2\cdot N_1-\sqrt{2\cdot N_1{}^2+4\cdot N_1{}^4\cdot N_2{}^2-1-N_1{}^4}\right)}{\left[\left(1+N_2{}^2\cdot N_1{}^2\right)\cdot N_1\right]}-DJ=0$$

$$\frac{1}{2}\cdot AB\cdot\frac{\left(3\cdot N_2\cdot N_1+4\cdot N_2{}^3\cdot N_1{}^3-N_1{}^3\cdot N_2+\sqrt{2\cdot N_1{}^2+4\cdot N_1{}^4\cdot N_2{}^2-1-N_1{}^4}\right)}{\left[\left(1+N_2{}^2\cdot N_1{}^2\right)\cdot N_1\right]}-EJ=0$$

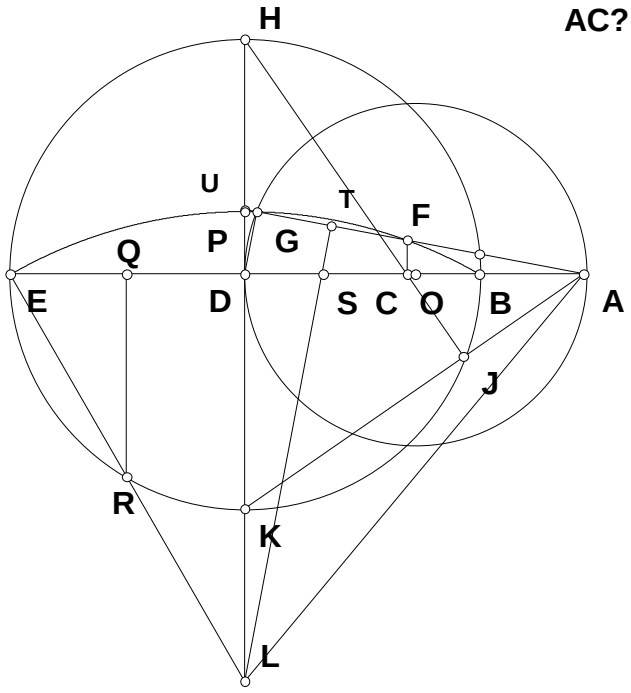
$$\frac{-1}{2}\cdot AB\,\frac{\left(-N_1\cdot N_2\cdot\sqrt{2\cdot N_1{}^2+4\cdot N_1{}^4\cdot N_2{}^2-1-N_1{}^4}+1-N_1{}^2+2\cdot N_2{}^2\cdot N_1{}^2\right)}{\left[N_1\cdot\left(1+N_2{}^2\cdot N_1{}^2\right)\right]}-FJ=0$$

$$\sqrt{AB^2\cdot N_2\cdot\frac{\left(3\cdot N_1\cdot N_2+4\cdot N_2{}^3\cdot N_1{}^3-N_1{}^3\cdot N_2+\sqrt{2\cdot N_1{}^2+4\cdot N_1{}^4\cdot N_2{}^2-1-N_1{}^4}\right)}{\left[\left(1+N_2{}^2\cdot N_1{}^2\right)\cdot N_1\right]}}-EF=0$$

$$\sqrt{\left(N_1{}^3\cdot N_2+N_1\cdot N_2-\sqrt{2\cdot N_1{}^2+4\cdot N_1{}^4\cdot N_2{}^2-1-N_1{}^4}\right)\cdot AB^2\cdot\frac{N_2}{\left[N_1\cdot\left(1+N_2{}^2\cdot N_1{}^2\right)\right]}}-DF=0$$

Counterpoint 042301

CF is the radius of a circle expressed in trisection. Is AF the counterpart of AC?



$N := 5 \qquad AB := 1$

$AE := AB \cdot N \qquad BE := AE - AB$

$BD := \frac{BE}{2} \qquad AD := AB + BD$

$AO := \frac{AD}{2} \qquad DE := BD \qquad DQ := \frac{DE}{2}$

$EQ := DQ \qquad BQ := BD + DQ$

$QR := \sqrt{BQ \cdot EQ} \qquad ER := \sqrt{QR^2 + EQ^2}$

$EL := 2 \cdot ER \qquad LP := EL \qquad DL := \frac{QR \cdot EL}{ER}$

$L_1 := \frac{LP}{DL} \qquad L_2 := \frac{AO}{LP}$

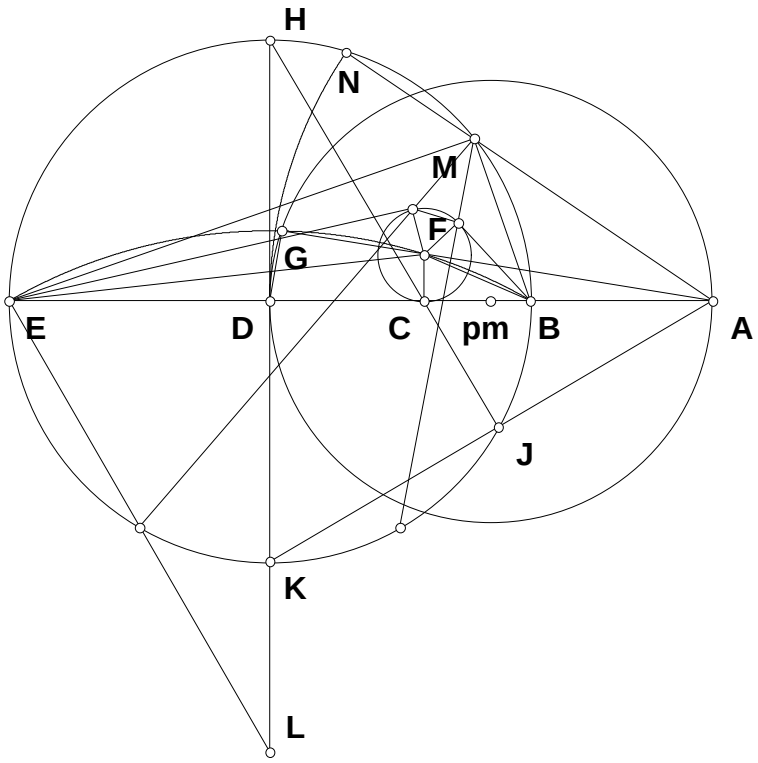
$$AG := \sqrt{LP^2 \cdot L_2 \cdot \frac{\left(3 \cdot L_1 \cdot L_2 + 4 \cdot L_2^3 \cdot L_1^3 - L_1^3 \cdot L_2 + \sqrt{2 \cdot L_1^2 + 4 \cdot L_1^4 \cdot L_2^2 - 1 - L_1^4}\right)}{\left[\left(1 + L_2^2 \cdot L_1^2\right) \cdot L_1\right]}}$$

$DG := \sqrt{AD^2 - AG^2} \qquad AU := \frac{AD \cdot AD}{AG} \qquad DU := \frac{DG \cdot AD}{AG} \qquad LU := DL + DU \qquad TU := \frac{DG \cdot LU}{AD} \qquad GU := AU - AG$

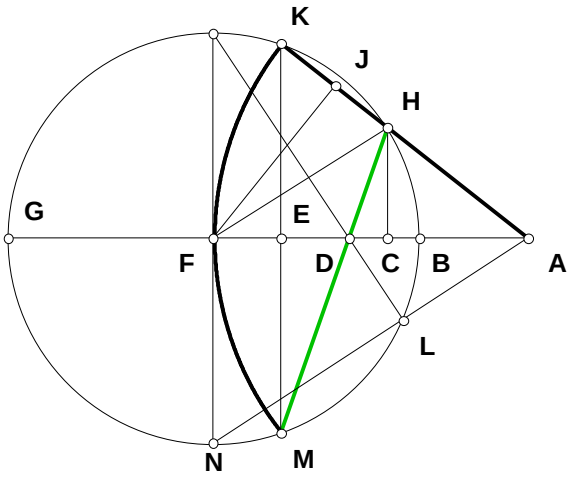
$TG := TU - GU \qquad FT := TG \qquad AF := AG - (FT + TG) \qquad AC := \frac{AD \cdot AF}{AU}$

From 012496 for AC

$$2 \cdot AB \cdot \frac{N}{(1+N)} \qquad AC - 2 \cdot AB \cdot \frac{N}{(1+N)} = 0$$



042401



Does HM intersect at D? What is the Algebraic name of HM in relation to AB and AG?

$N := 5$ $AB := 1$ $AG := AB \cdot N$

$BG := AG - AB$ $BF := \frac{BG}{2}$ $AF := AB + BF$

$AK := AF$ $FK := BF$ $AE := \frac{2\,AK^2 - FK^2}{2\,AF}$

$AJ := AE$ $JK := AK - AJ$ $HJ := JK$

$AH := AK - (JK + HJ)$ $AC := \frac{AE \cdot AH}{AK}$ $CE := AE - AC$ $BE := AE - AB$ $EG := BG - BE$

$EK := \sqrt{BE \cdot EG}$ $BC := AC - AB$ $CG := BG - BC$ $CH := \sqrt{BC \cdot CG}$ $DE := \frac{CE \cdot EK}{EK + CH}$

$DF := 2 \cdot DE$ $HM := \sqrt{CE^2 + (EK + CH)^2}$

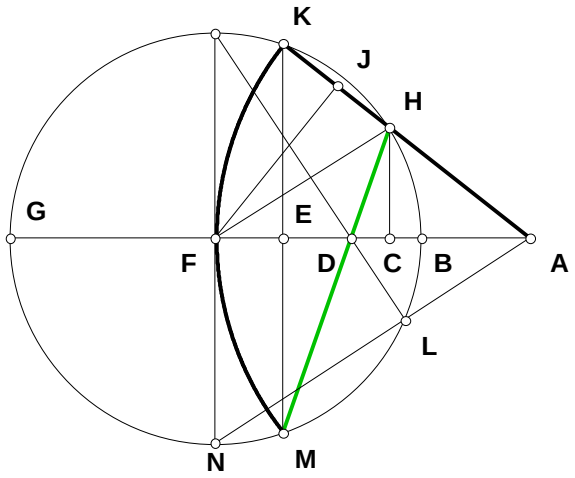
Some Algebraic Names:

$AB \cdot N - AB - BG = 0$ $\frac{1}{2} \cdot AB \cdot N - \frac{1}{2} \cdot AB - BF = 0$ $\frac{1}{2} \cdot AB + \frac{1}{2} \cdot AB \cdot N - AF = 0$

$\frac{1}{4} \cdot AB \cdot \frac{\left(N^2 + 6 \cdot N + 1\right)}{(1 + N)} - AE = 0$ $\frac{1}{4} \cdot AB \cdot \frac{\left(1 - 2 \cdot N + N^2\right)}{(1 + N)} - JK = 0$ $2 \cdot AB \cdot \frac{N}{(1 + N)} - AH = 0$

$AB \cdot \frac{\left(1 + 6 \cdot N + N^2\right)}{(1 + N)^3} \cdot N - AC = 0$ $\frac{1}{4} \cdot AB \cdot \left(N^2 + 6 \cdot N + 1\right) \cdot \frac{(N - 1)^2}{(1 + N)^3} - CE = 0$

$\frac{1}{4} \cdot AB \cdot (N + 3) \cdot \frac{(N - 1)}{(1 + N)} - BE = 0$ $\frac{1}{4} \cdot AB \cdot (3 \cdot N + 1) \cdot \frac{(N - 1)}{(1 + N)} - EG = 0$



$$\frac{1}{4}\cdot AB\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot\frac{(N-1)}{(1+N)}-EK=0$$

$$AB\cdot(3\cdot N+1)\cdot\frac{(N-1)}{(1+N)^3}-BC=0$$

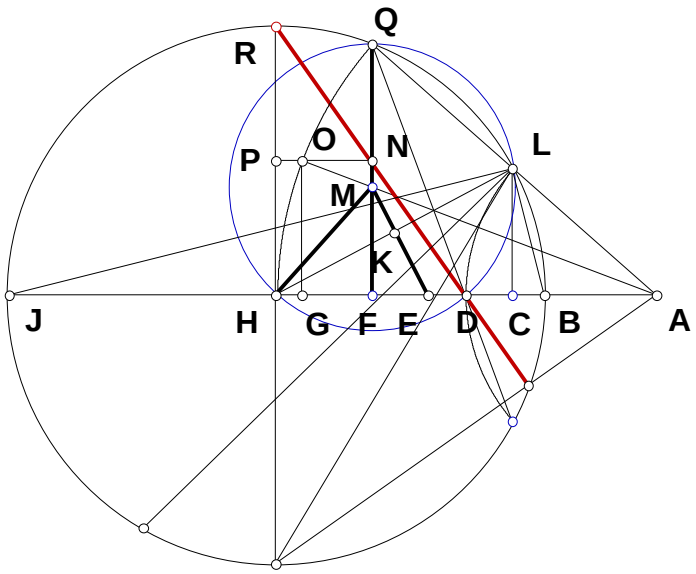
$$AB\cdot N^2\cdot(N+3)\cdot\frac{(N-1)}{(1+N)^3}-CG=0$$

$$AB\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N\cdot\frac{(N-1)}{(1+N)^3}-CH=0$$

$$\frac{1}{4}\cdot AB\cdot\frac{(N-1)^2}{(1+N)}-DE=0 \qquad \frac{1}{2}\cdot AB\cdot\frac{(N-1)^2}{(N+1)}-DF=0 \qquad \frac{1}{2}\cdot AB\cdot(N-1)\cdot\frac{\left(1+6\cdot N+N^2\right)}{(1+N)^2}-HM=0$$

042501

What is the Algebraic name of the circle HM? Does point N divide DR in half?



$N := 5.768$ $AB := .583$ $AJ := AB \cdot N$

$BJ := AJ - AB$ $BH := \frac{BJ}{2}$ $HR := BH$

$HP := \frac{HR}{2}$ $GO := HP$ $AH := AB + BH$

$AO := AH$ $AG := \sqrt{AO^2 - GO^2}$

$HQ := BH$ $AQ := AH$ $FH := \frac{HQ^2}{2 \cdot AH}$

$AF := AH - FH$ $FM := \frac{GO \cdot AF}{AG}$

$HJ := BH$ $FJ := FH + HJ$ $BF := BJ - FJ$

$FQ := \sqrt{BF \cdot FJ}$ $MQ := FQ - FM$ $HM := \sqrt{FH^2 + FM^2}$ $HM - MQ = 0$

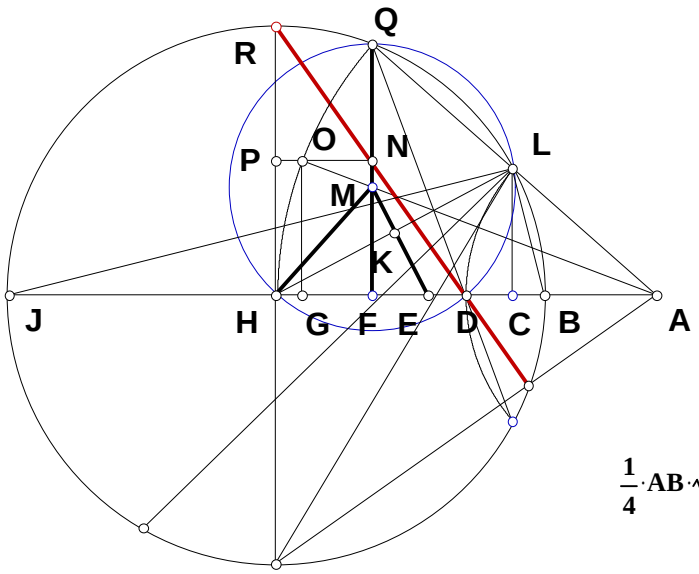
$DH := \frac{HR^2}{AH}$ $\frac{DH}{2} - FH = 0$

Some Algebraic Names:

$AB \cdot N - AB - BJ = 0$ $\frac{1}{2} \cdot AB \cdot (N - 1) - BH = 0$ $\frac{1}{4} \cdot AB \cdot (N - 1) - HP = 0$

$\frac{1}{2} \cdot AB \cdot (1 + N) - AH = 0$ $\frac{1}{4} \cdot AB \cdot \sqrt{(N + 3) \cdot (3 \cdot N + 1)} - AG = 0$ $\frac{1}{4} \cdot AB \cdot \frac{(N - 1)^2}{(1 + N)} - FH = 0$

$\frac{1}{4} \cdot AB \cdot \frac{\left(1 + 6 \cdot N + N^2\right)}{(1 + N)} - AF = 0$ $\frac{1}{4} \cdot (N - 1) \cdot AB \cdot \frac{\left(1 + 6 \cdot N + N^2\right)}{\left[(1 + N) \cdot \sqrt{(N + 3) \cdot (3 \cdot N + 1)}\right]} - FM = 0$



$$\frac{1}{4}\cdot AB\cdot(N-1)\cdot\frac{(3\cdot N+1)}{(1+N)}-FJ=0$$

$$\frac{1}{4}\cdot AB\cdot(N+3)\cdot\frac{(N-1)}{(1+N)}-BF=0$$

$$\frac{1}{4}\cdot AB\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot\frac{(N-1)}{(1+N)}-FQ=0$$

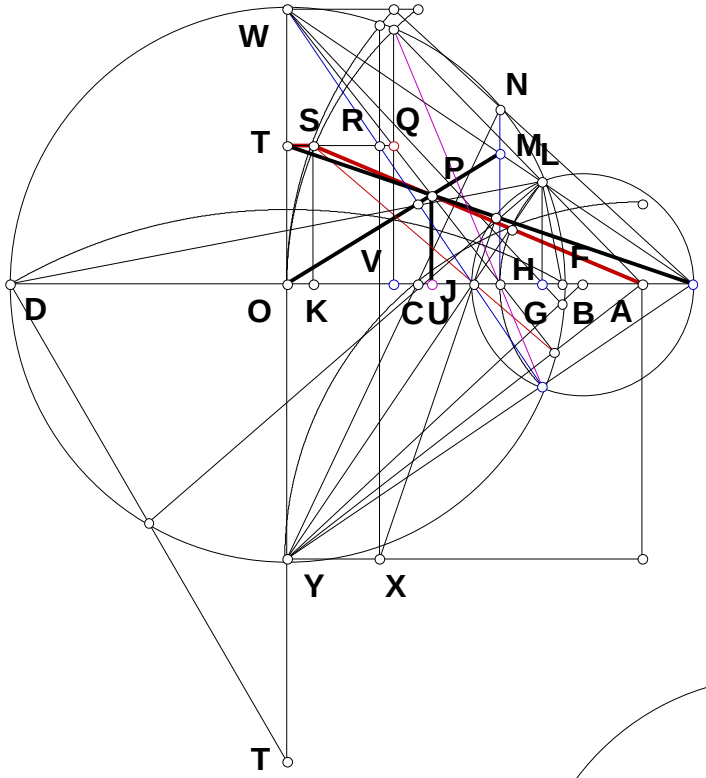
$$\frac{1}{2}\cdot(1+N)\cdot AB\cdot\frac{(N-1)}{\sqrt{(N+3)\cdot(3\cdot N+1)}}-MQ=0$$

$$\frac{1}{2}\cdot AB\cdot(N-1)\cdot\frac{(1+N)}{\sqrt{(N+3)\cdot(3\cdot N+1)}}-HM=0$$

$$HM-MQ=0$$

$$\frac{1}{2}\cdot AB\cdot\frac{(N-1)^2}{(1+N)}-DH=0 \qquad \frac{DH}{2}-FH=0$$

Four Lines To A Point 042901

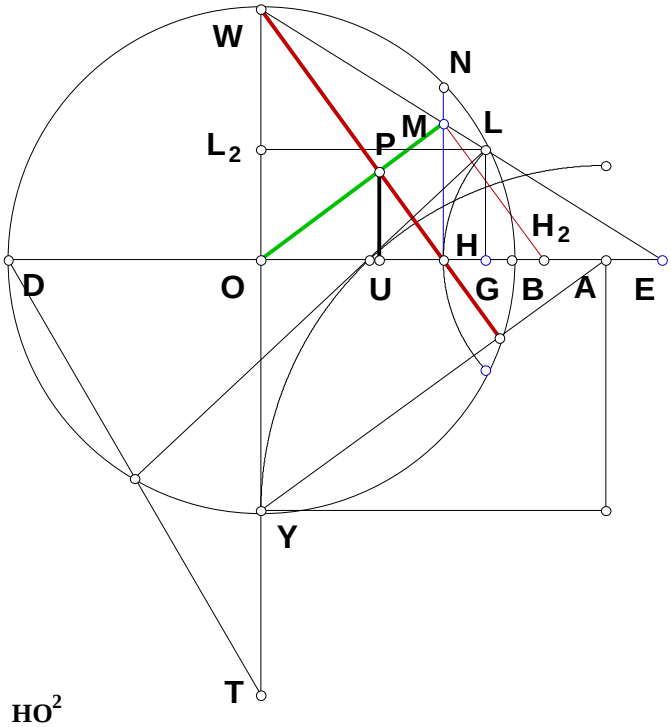


Does the difference OU and PU each have but one Algebraic name?

$N := 5 \qquad AB := 1 \qquad AD := AB \cdot N$

$BD := AD - AB \qquad BO := \frac{BD}{2} \qquad OW := BO$

$OY := BO \qquad DO := BO \qquad AO := AB + BO$



$HO := \frac{OY^2}{AO} \qquad AH := AO - HO \qquad AL := AH$

$OL := BO \qquad GO := \frac{OL^2 + AO^2 - AL^2}{2\,AO}$

$BG := BO - GO \qquad DG := GO + DO$

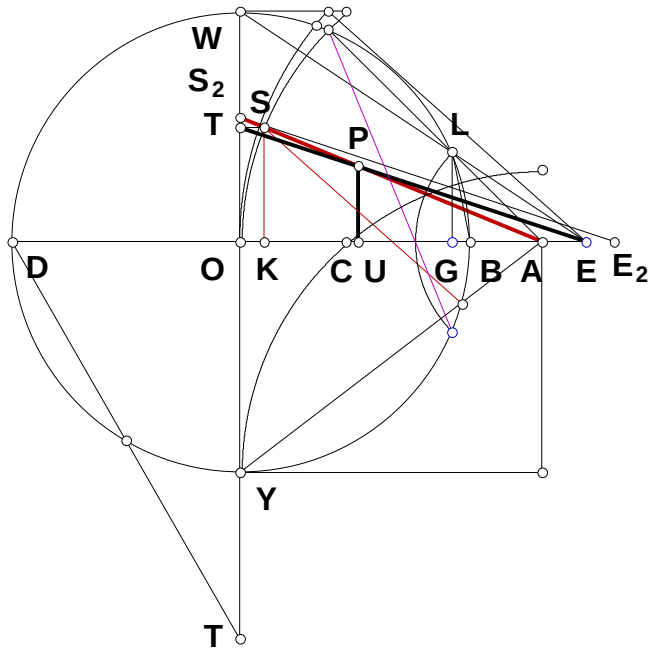
$GL := \sqrt{BG \cdot DG} \qquad EO := \frac{GO \cdot OW}{OW - GL}$

$BE := EO - BO \qquad BH := BO - HO$

$EG := BE + BG \qquad EH := BE + BH$

$HM := \frac{GL \cdot EH}{EG} \qquad HH_2 := \frac{HO \cdot HM}{OW} \qquad OU := \frac{HO^2}{HH_2 + HO}$

$UP := \frac{HM \cdot OU}{HO}$



$$OT := \frac{OW}{2} \qquad KS := OT \qquad AS := AO$$

$$AK := \sqrt{AS^2 - KS^2} \qquad OS_2 := \frac{KS \cdot AO}{AK}$$

$$OE_2 := \frac{EO \cdot OS_2}{OT} \qquad AS_2 := \sqrt{AO^2 + OS_2{}^2}$$

$$AE_2 := OE_2 - AO \qquad AE := EO - AO$$

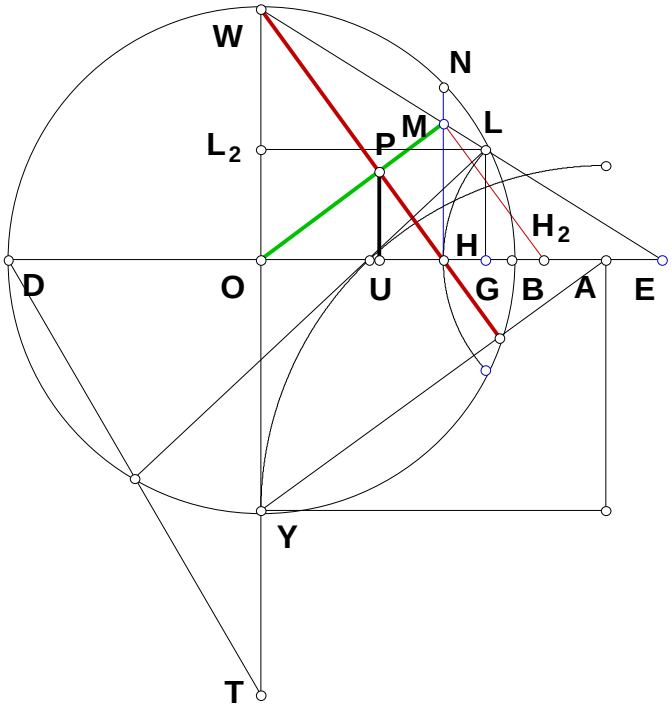
$$AP := \frac{AS_2 \cdot AE}{AE_2} \qquad AU := \frac{AO \cdot AE}{AE_2}$$

$$UO := AO - AU \qquad PU := \frac{OS_2 \cdot AU}{AO}$$

$$UO - OU = 0$$

$$PU - UP = 0$$

Some Algebraic Names:



$$AB\cdot(N-1)-BD=0$$

$$\frac{AB\cdot(N-1)}{2}-BO=0$$

$$\frac{1}{2}\cdot AB\cdot(1+N)-AO=0$$

$$\frac{1}{2}\cdot AB\cdot\frac{(N-1)^2}{(1+N)}-HO=0$$

$$2\cdot AB\cdot\frac{N}{(1+N)}-AH=0$$

$$\frac{1}{2}\cdot AB\cdot\left(N^2+4\cdot N+1\right)\cdot\frac{(N-1)^2}{(1+N)^3}-GO=0$$

$$AB\cdot(3\cdot N+1)\cdot\frac{(N-1)}{(1+N)^3}-BG=0$$

$$AB\cdot(N-1)\cdot N^2\cdot\frac{(N+3)}{(1+N)^3}-DG=0$$

$$\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N\cdot(N-1)\cdot\frac{AB}{(1+N)^3}-GL=0$$

$$\frac{1}{2}\cdot AB\cdot\left(N^2+4\cdot N+1\right)\cdot\frac{(N-1)^2}{\left[3\cdot N+1+3\cdot N^2+N^3-2\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N\right]}-EO=0$$

$$AB\cdot(N-1)\cdot\frac{\left[\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N-3\cdot N-1\right]}{\left[3\cdot N+1+3\cdot N^2+N^3-2\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N\right]}-BE=0$$

$$AB\cdot\frac{(N-1)}{(1+N)}-BH=0$$

$$AB\cdot\frac{(N-1)^2\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N\cdot\left(N^2+4\cdot N+1\right)}{\left[\left[3\cdot N+1+3\cdot N^2+N^3-2\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N\right]\cdot(1+N)^3\right]}-EG=0$$

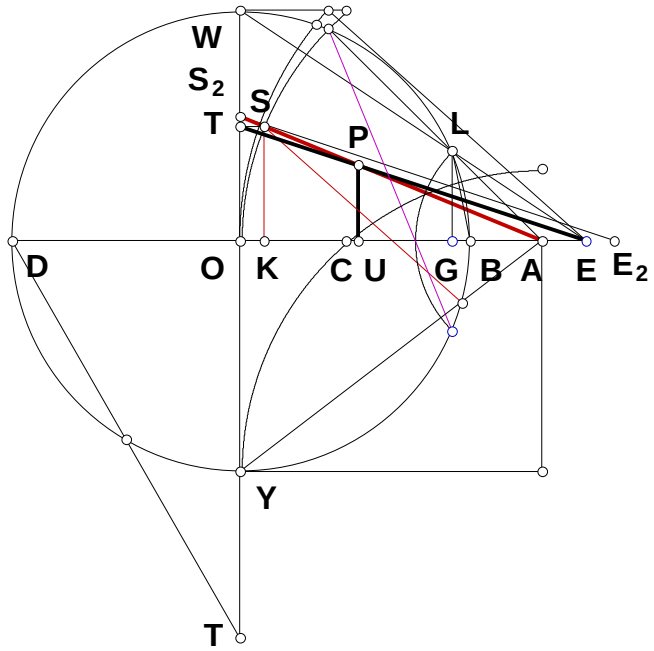
$$AB\cdot(N-1)^2\cdot N\cdot\frac{\left[N+\sqrt{(N+3)\cdot(3\cdot N+1)}+1\right]}{\left[\left[3\cdot N+1+3\cdot N^2+N^3-2\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N\right]\cdot(1+N)\right]}-EH=0$$

$$N\cdot(N-1)\cdot\frac{AB}{(1+N)}\cdot\frac{\left[N+\sqrt{(N+3)\cdot(3\cdot N+1)}+1\right]}{\left(N^2+4\cdot N+1\right)}-HM=0$$

$$AB\cdot\frac{(N-1)^2}{(1+N)^2}\cdot N\cdot\frac{\left[N+\sqrt{(N+3)\cdot(3\cdot N+1)}+1\right]}{\left(N^2+4\cdot N+1\right)}-HH_2=0$$

$$\frac{1}{2}\cdot AB\cdot(N-1)^2\cdot\frac{\left(N^2+4\cdot N+1\right)}{\left[7\cdot N\cdot(N+1)+2\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N+1+N^3\right]}-OU=0$$

$$N\cdot(N-1)\cdot AB\cdot\frac{\left[N+\sqrt{(N+3)\cdot(3\cdot N+1)}+1\right]}{\left[7\cdot N+7\cdot N^2+2\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N+1+N^3\right]}-UP=0$$



$$\frac{1}{4}\cdot AB\cdot(N-1)-OT=0$$

$$\frac{AB}{4}\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}-AK=0$$

$$\frac{1}{2}\cdot AB\cdot\frac{(N-1)\cdot(1+N)}{\sqrt{(N+3)\cdot(3\cdot N+1)}}-OS_2=0$$

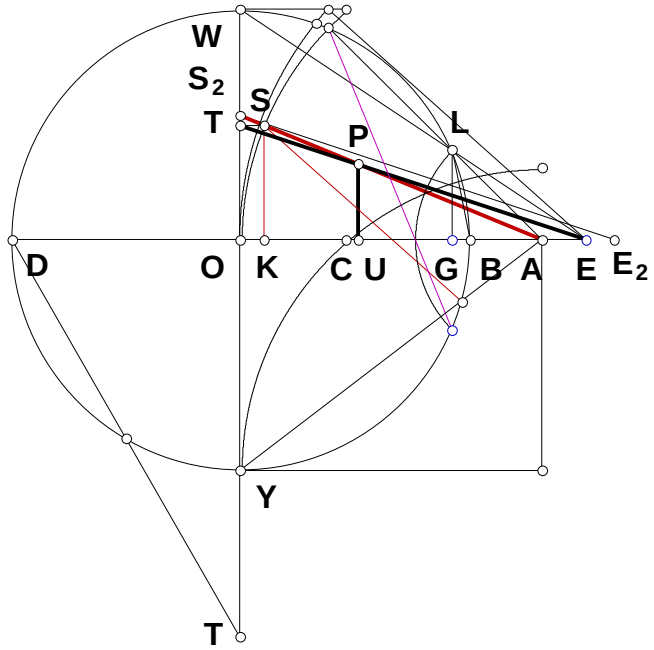
$$\frac{\left[AB\cdot\left(N^2+4\cdot N+1\right)\cdot(N-1)^2\right]}{\left[3\cdot N+1+3\cdot N^2+N^3-2\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N\right]}\cdot\frac{(1+N)}{\sqrt{(N+3)\cdot(3\cdot N+1)}}-OE_2=0$$

$$(1+N)^2\cdot\frac{AB}{\sqrt{3+10\cdot N+3\cdot N^2}}-AS_2=0$$

$$\frac{\left[AB\cdot\left(N^2+4\cdot N+1\right)\cdot(N-1)^2\right]}{\left[3\cdot N+1+3\cdot N^2+N^3-2\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N\right]}\cdot\frac{(1+N)}{\sqrt{(N+3)\cdot(3\cdot N+1)}}-\frac{1}{2}\cdot AB\cdot(1+N)-AE_2=0$$

$$-AB\cdot N\cdot\frac{\left[N^2+6\cdot N+1-\sqrt{(N+3)\cdot(3\cdot N+1)}-\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N\right]}{\left[3\cdot N+1+3\cdot N^2+N^3-2\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N\right]}-AE=0$$

$$\frac{-2\cdot AB\cdot N\cdot(1+N)\cdot\left[N^2+6\cdot N-\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N+1-\sqrt{(N+3)\cdot(3\cdot N+1)}\right]}{\left(2\cdot N^4+10\cdot N^3+8\cdot N^2+10\cdot N+2\right)-3\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N\ \ldots}-AP=0$$
$$+\ -\sqrt{(N+3)\cdot(3\cdot N+1)}-3\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N^2-\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N^3$$



$$\frac{-AB\cdot N\cdot\left[N^2+6\cdot N+1-\sqrt{(N+3)\cdot(3\cdot N+1)}-\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N\right]\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}}{\left(2\cdot N^4+10\cdot N^3+8\cdot N^2+10\cdot N+2\right)-3\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N\ \ldots}-AU=0$$
$$+\ -\sqrt{(N+3)\cdot(3\cdot N+1)}-3\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N^2-\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N^3$$

$$\frac{1}{2}\cdot AB\cdot(N-1)^2\cdot\frac{\left(N^2+4\cdot N+1\right)}{\left[7\cdot N\cdot(N+1)+2\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N+1+N^3\right]}-UO=0$$

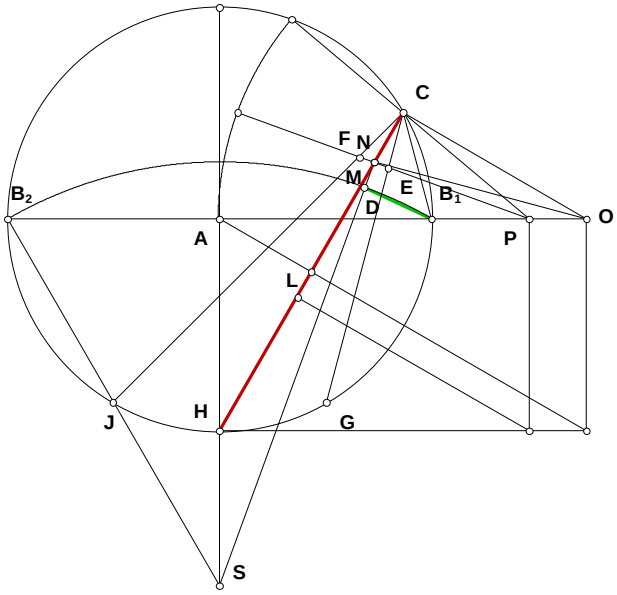
$$N\cdot(N-1)\cdot AB\cdot\frac{\left[N+\sqrt{(N+3)\cdot(3\cdot N+1)}+1\right]}{\left[7\cdot N+7\cdot N^2+2\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N+1+N^3\right]}-PU=0$$

Compass Construction 043001

$m\angle AB_1C = 75.000°$ $m\angle AB_2C = 15.000°$

$m\angle AB_1D = 25.000°$ $m\angle AB_2D = 5.000°$

$\frac{m\angle AB_1C}{m\angle AB_1D} = 3.000$ $\frac{m\angle AB_2C}{m\angle AB_2D} = 3.000$



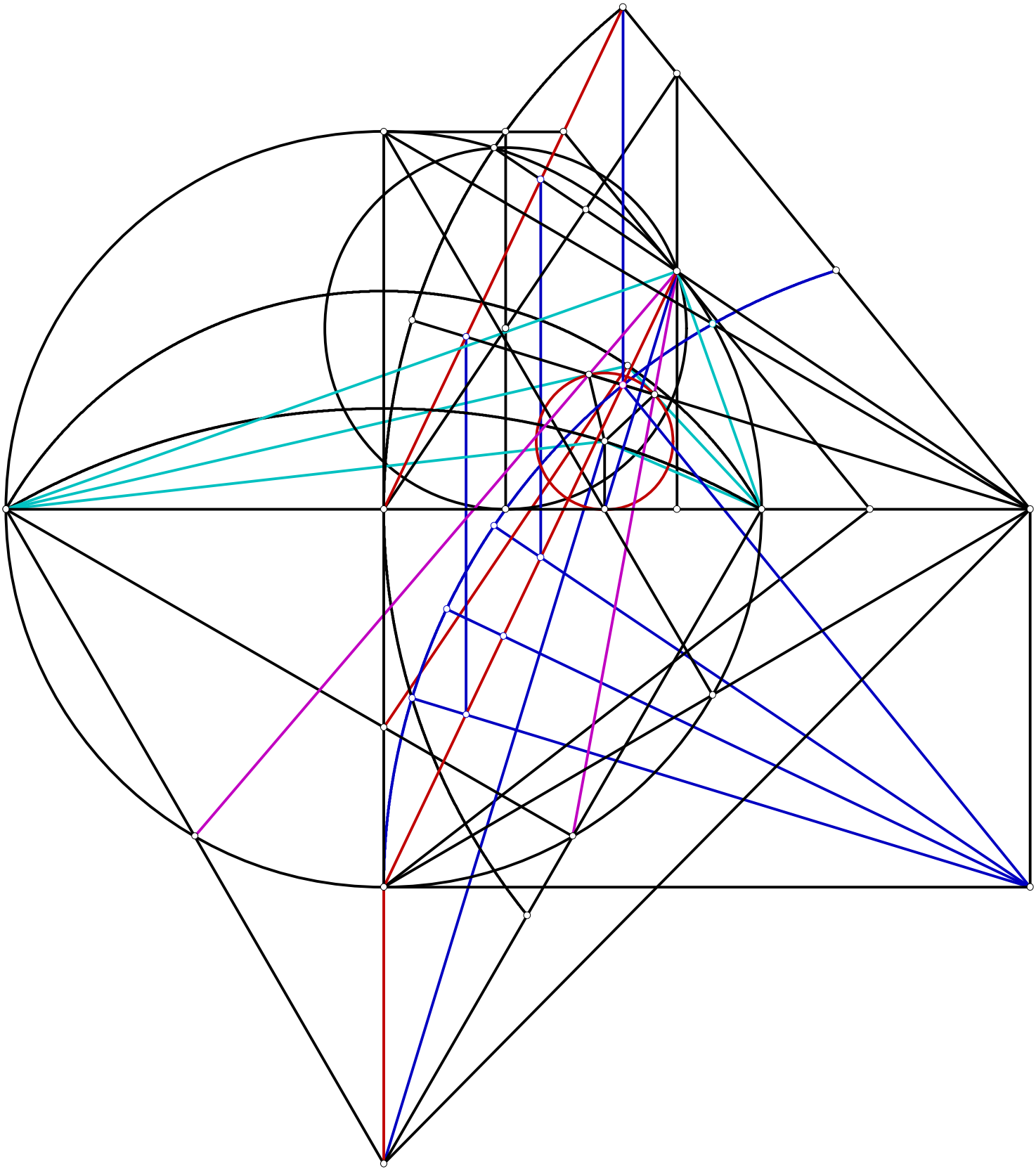
$m\angle ABC - 3 \cdot m\angle ABD = 0.000°$

$m\angle AB_2C - 3 \cdot m\angle AB_2D = -0.000°$

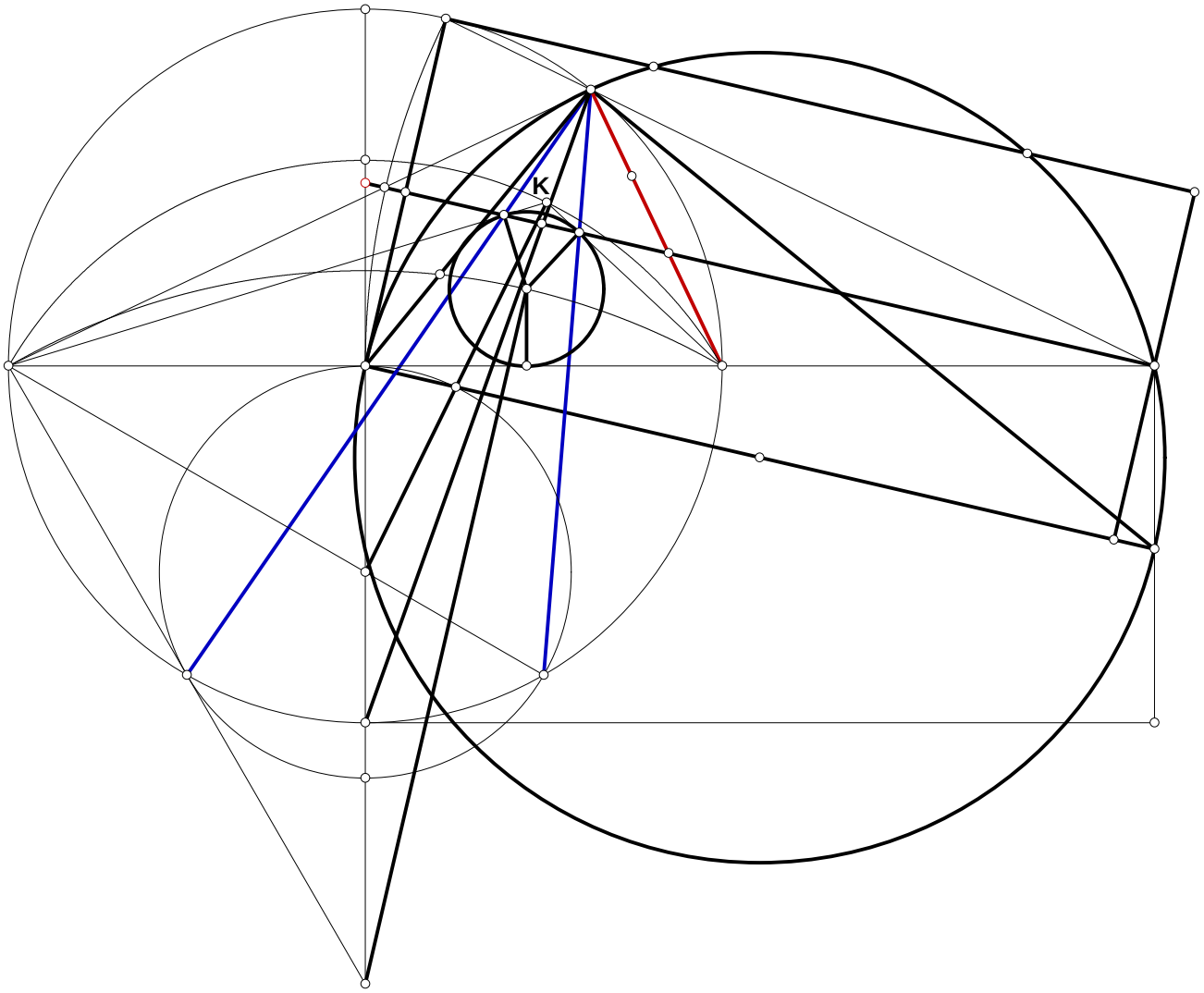
Move C->60 | Move C->75

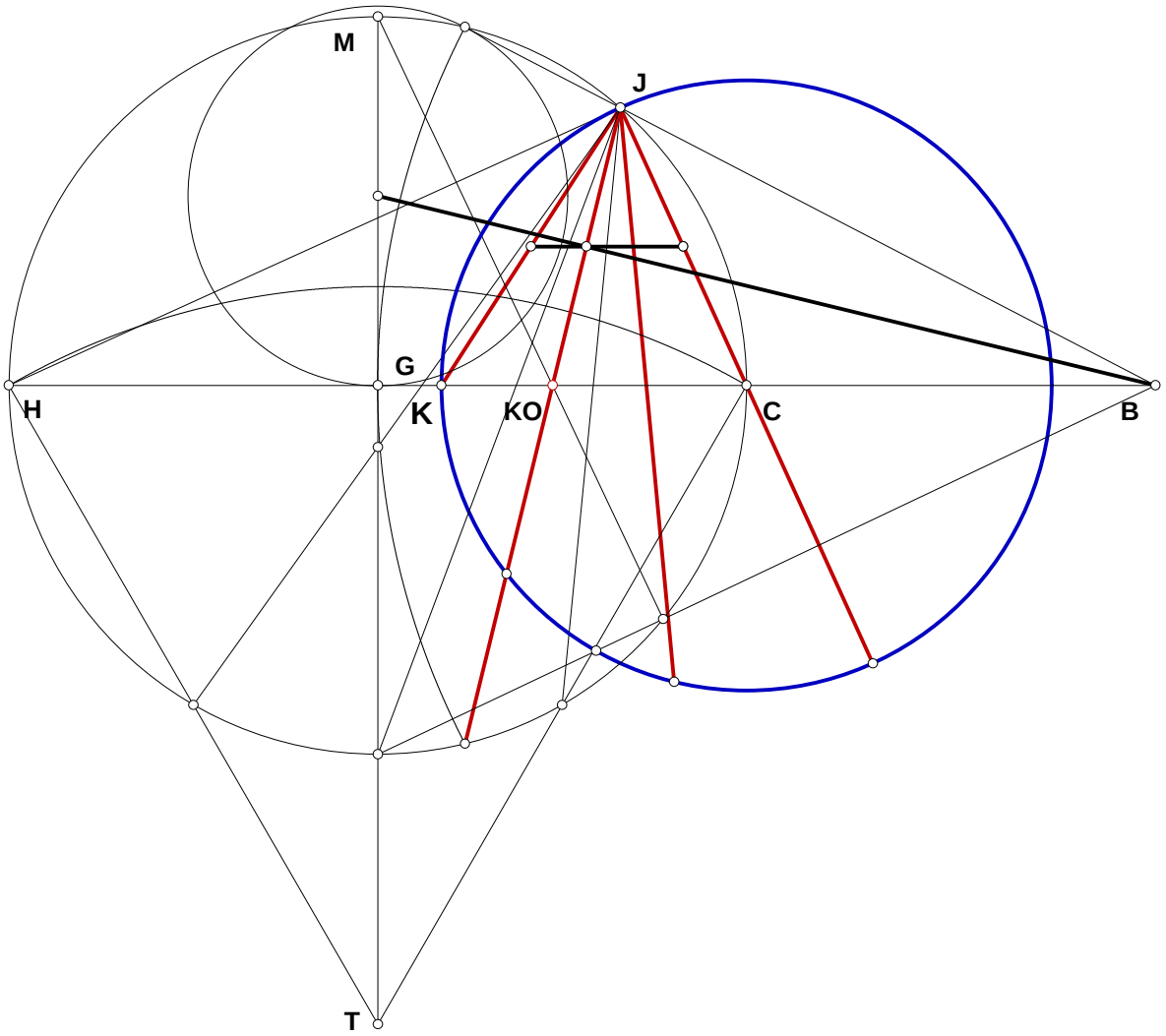
The process is simple, construct point O and then bisect AOC. From point N construct P from the perpendicular L-which is the midpoint of NS.
Bisect APC constructing E and F which are bisected at point M. Draw S to M to construct point D.

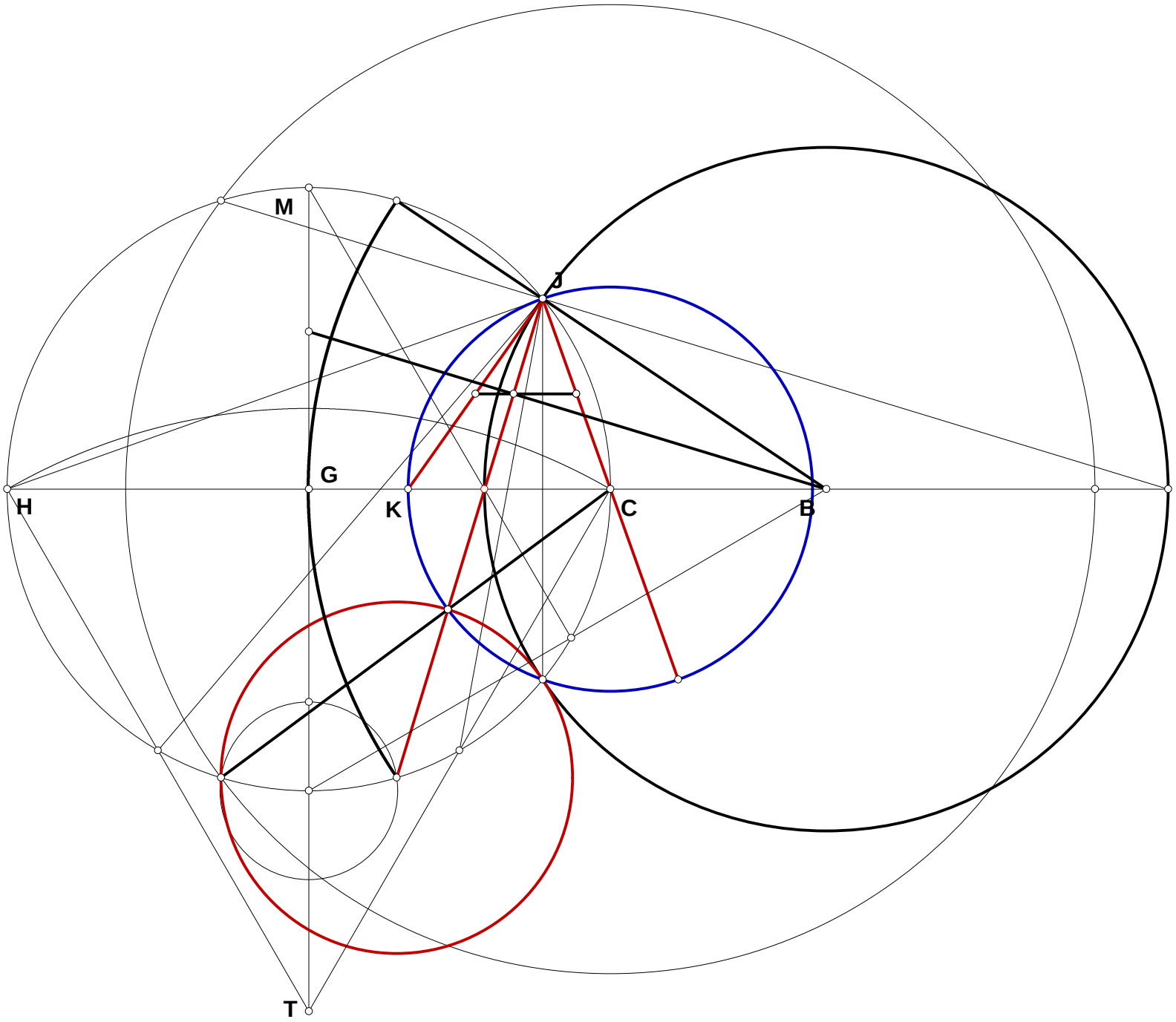
When there is no difference between two things, those things are said to be equal. This is true even of tolerance. If a figure is more accurate than the tools used to construct the figure, then that figure is equal, in that tool, to a solution that is tool independant.



Pull K.




M
J
G
H
K
KO
C
B
T


M
J
G
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K
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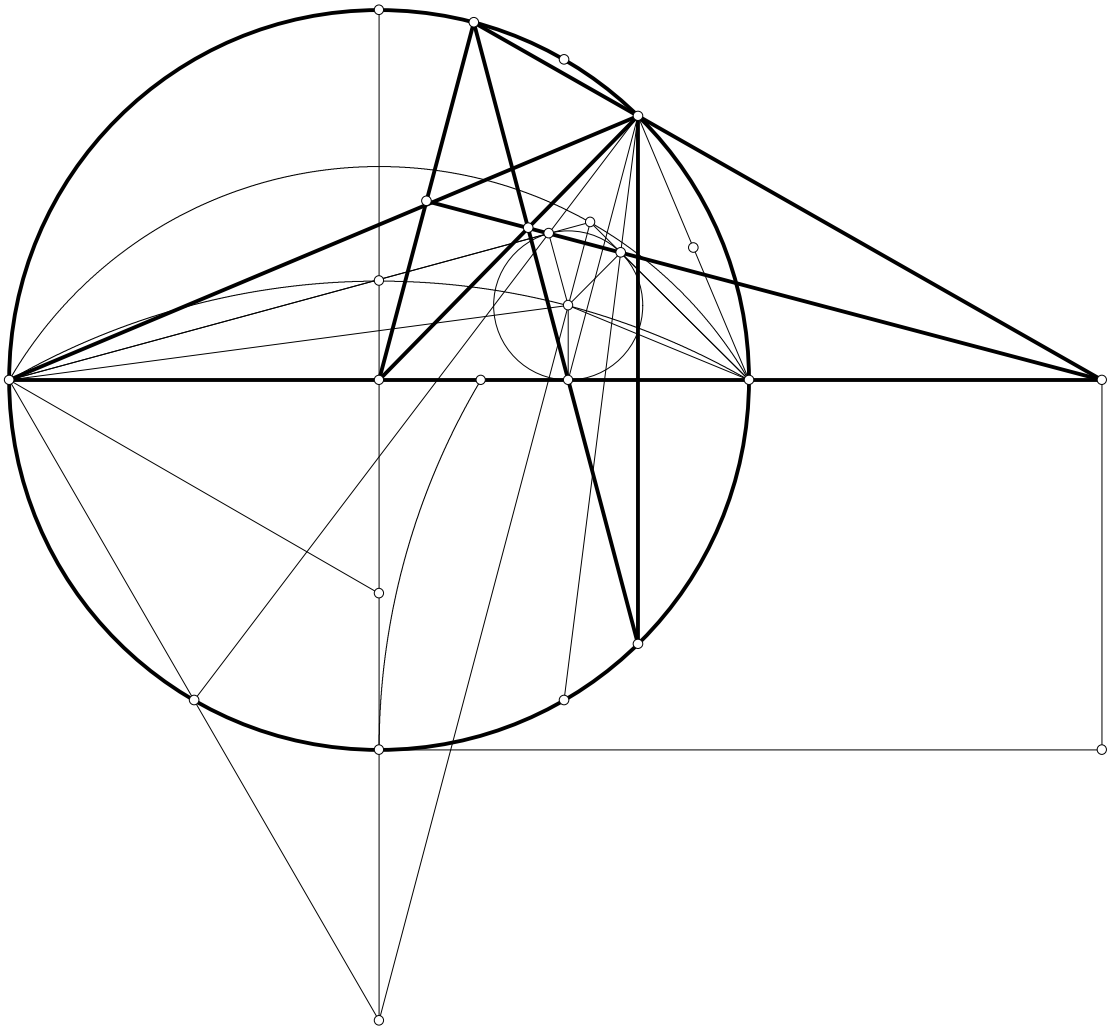
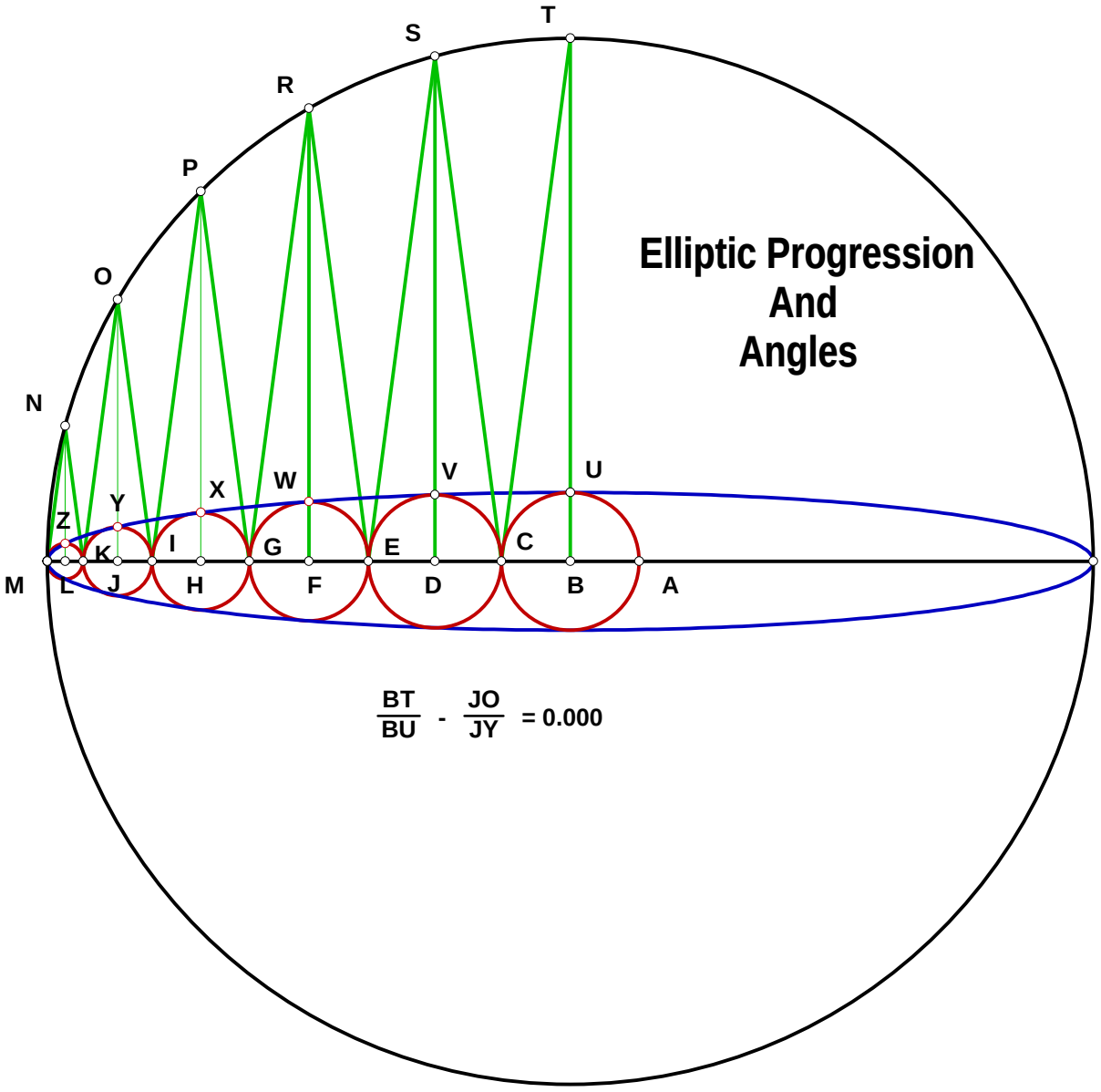
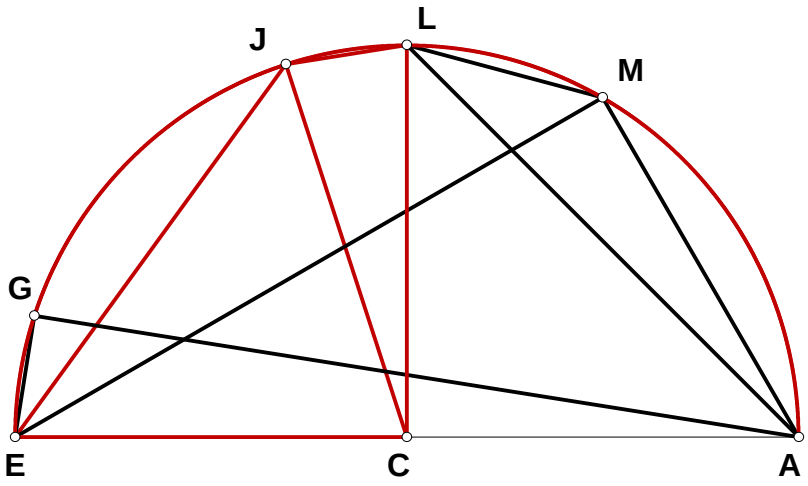
T




T
S
R
P
O
N
M
L
K
J
I
H
G
F
E
D
C
B
A
Z
Y
X
W
V
U
Elliptic Progression
And
Angles
BT/BU - JO/JY = 0.000

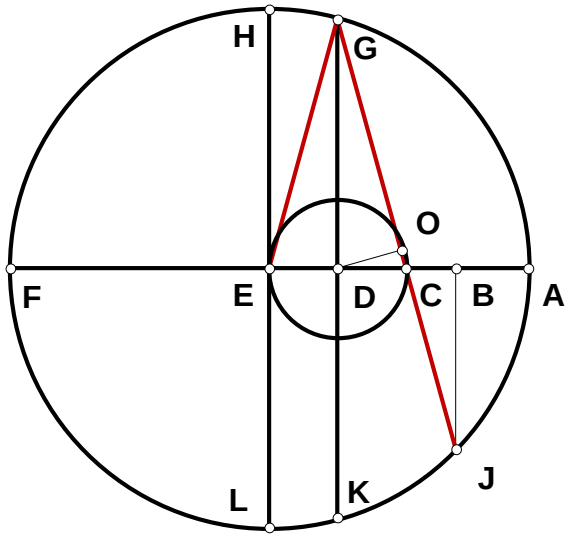


$$EM := \frac{1}{2}\cdot\sqrt{3} \qquad AL := \frac{1}{2}\cdot\sqrt{2} \qquad JL := \frac{1}{4}\cdot\sqrt{8 - 2\cdot\sqrt{10 + 2\cdot\sqrt{5}}} \qquad LM := \frac{1}{4}\cdot\sqrt{6} - \frac{1}{4}\cdot\sqrt{2}$$

$$AM := \frac{1}{2} \qquad EJ := \frac{1}{4}\cdot\sqrt{10 - 2\cdot\sqrt{5}}$$

$$AG := \frac{1}{4}\cdot\sqrt{8 + 2\cdot\sqrt{10 + 2\cdot\sqrt{5}}}$$

Elliptic Progression Outtake One 0507011



A method of trisection Algebraically.

$N := M$

$N \geq 4 = 1$ $\quad AF := 6$ $\quad AE := \frac{AF}{2}$

$DE := \frac{AF}{N}$ $\quad AD := AE - DE$ $\quad DF := AF - AD$

$DG := \sqrt{AD \cdot DF}$ $\quad CD := DE$ $\quad EG := AE$

$CO := \frac{CD^2}{EG}$ $\quad CG := EG$ $\quad CJ := CG - 4 \cdot CO$

$BC := \frac{CD \cdot CJ}{CG}$ $\quad AB := AE - (2 \cdot DE + BC)$

$BJ := \frac{DG \cdot BC}{CD}$ $\quad BD := BC + CD$

$JK := \sqrt{DG^2 - 2 \cdot DG \cdot BJ + BJ^2 + BD^2}$ $\quad \frac{JK}{2 \cdot DE} = 1$ **Some Algebraic Names,**

Part of this demonstration may be something of a reductio ad absurdum, if one supposed that CJ were not true. I suppose I need a plate to demonstrate it.

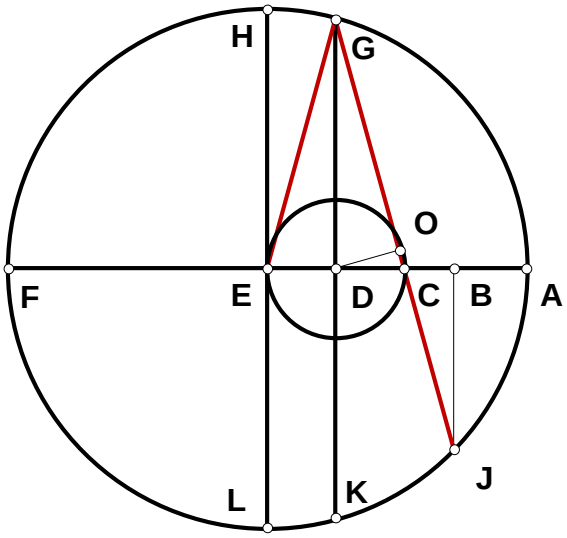
$AF \cdot \frac{(N-2)}{2 \cdot N} - AD = 0$ $\quad AF \cdot \frac{(N+2)}{2 \cdot N} - DF = 0$ $\quad AF \cdot \frac{\sqrt{(N-2) \cdot (N+2)}}{2 \cdot N} - DG = 0$

$\frac{2\ AF}{N^2} - CO = 0$ $\quad AF \cdot \frac{(N-4) \cdot (N+4)}{2 \cdot N^2} - CJ = 0$ $\quad AF \cdot \frac{(N-4) \cdot (N+4)}{N^3} - BC = 0$

$AF \cdot \frac{(N+2) \cdot (N-4)^2}{2 \cdot N^3} - AB = 0$ **One of the meanings of trisection is solving for the following equation when given AF and AB.**

$$\frac{AF}{AB} - \frac{2 \cdot N^3}{(N+2) \cdot (N-4)^2} = 0$$

$AF \cdot \frac{(N-4) \cdot (N+4) \cdot \sqrt{(N-2) \cdot (N+2)}}{2 \cdot N^3} - BJ = 0$ $\quad AF \cdot \frac{2 \cdot (N^2 - 8)}{N^3} - BD = 0$ $\quad \frac{2 \cdot AF}{N} - JK = 0$



$$\frac{2\cdot M^3}{(M+2)\cdot(M-4)^2} - \frac{AF}{AB} = 0 \qquad \frac{AF}{AB} = 6$$

$$\frac{2\cdot M^3}{(M+2)\cdot(M-4)^2} - 6 = 0$$

$$\frac{2\cdot M^3}{(M+2)\cdot(M-4)^2} = 6$$

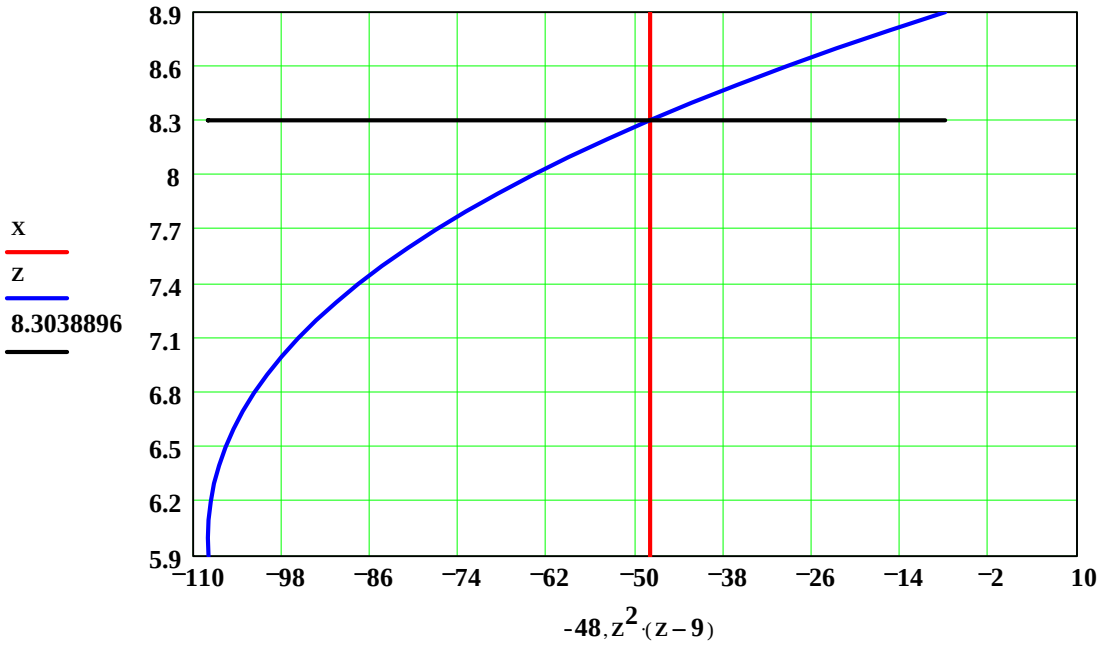
$$2\cdot M^3 - 6\cdot\left[(M+2)\cdot(M-4)^2\right] = 0$$

$$2\cdot M^3 - \left(6\cdot M^3 - 36\cdot M^2 + 192\right) = 0$$

$$4\cdot M^3 - 36\cdot M^2 + 192 = 0$$

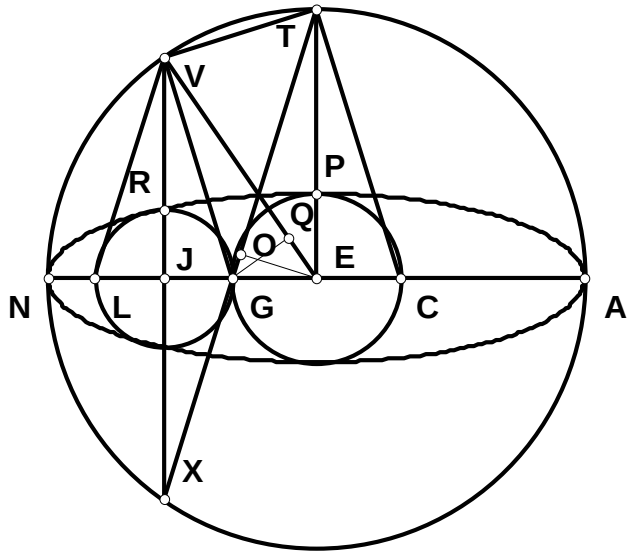
$$M^3 - 9\cdot M^2 + 48 = 0 \qquad M^2\cdot(M-9) + 48 = 0 \qquad M \equiv 8.303889634816388$$

$$\frac{2\cdot M^3}{(M+2)\cdot(M-4)^2} = 6 \qquad DE - \frac{AF}{M} = 0 \qquad Z := 5.9, 6 .. 8.9$$



Elliptic Progression Outtake Two 0507012

Angles TEV and EVJ equals CTG.



$N := 6.381 \quad AN := 2.792$

$EN := \frac{AN}{2} \quad ET := EN \quad EV := EN$

$EG := \frac{AN}{N} \quad EP := EG \quad GT := \sqrt{EG^2 + ET^2}$

$GO := \frac{EG^2}{GT} \quad GX := GT - 2 \cdot GO$

$JX := \frac{ET \cdot GX}{GT} \quad GJ := \frac{EG \cdot GX}{GT}$

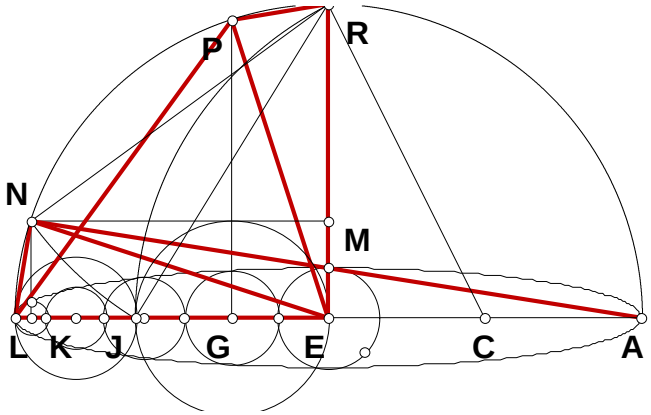
$\frac{ET}{EP} - \frac{JX}{GJ} = 0 \qquad JV := JX$

$EJ := EG + GJ$

$TV := \sqrt{ET^2 - 2 \cdot ET \cdot JV + JV^2 + EJ^2}$

$\frac{ET}{TV} - \frac{GT}{2 \cdot EG} = 0 \qquad EQ := \frac{EJ \cdot EG}{EV} \quad OQ := \frac{JV \cdot EQ}{EJ} \quad OQ - GJ = 0$

Outtake Three: Alternate Method: Pentasection Or Irrational Rationals 0507013



$AL := 1 \qquad AE := \frac{AL}{2} \qquad AC := \frac{AE}{2}$

$CE := AC \quad ER := AE \quad CR := \sqrt{CE^2 + ER^2}$

$CJ := CR \qquad EJ := CJ - CE$

$JR := \sqrt{EJ^2 + ER^2} \quad NR := JR$

$EN := AE \quad EM := \frac{EN^2 + ER^2 - NR^2}{2 \cdot ER}$

$KN := EM \quad EK := \sqrt{EN^2 - KN^2} \quad EL := AE \qquad KL := EL - EK \qquad LN := \sqrt{KL^2 + KN^2}$

$EG := \frac{EJ}{2} \qquad GL := EL - EG \quad AG := AE + EG \qquad GP := \sqrt{AG \cdot GL} \qquad PR := \sqrt{ER^2 - 2 \cdot ER \cdot GP + GP^2 + EG^2}$

$PR - LN = 0 \qquad AN := \sqrt{AL^2 - LN^2}$

Irrational **means the inability of a grammar to provide a name for a given thing. Many things are then irrational in Arithmetic due to the principles of the naming convention. Algebraic naming solves the problem by incorporating operands as part of a name. Algebra provides a degree of rationality then that is not achievable by Arithmetic. The following are some Algebraic names.**

$\frac{1}{2} - AE = 0 \qquad \frac{1}{4} - AC = 0 \qquad \frac{1}{4} \cdot \sqrt{5} - CR = 0 \qquad \frac{1}{4} \cdot \sqrt{5} - \frac{1}{4} - EJ = 0 \qquad \frac{1}{4} \cdot \sqrt{10 - 2 \cdot \sqrt{5}} - JR = 0$

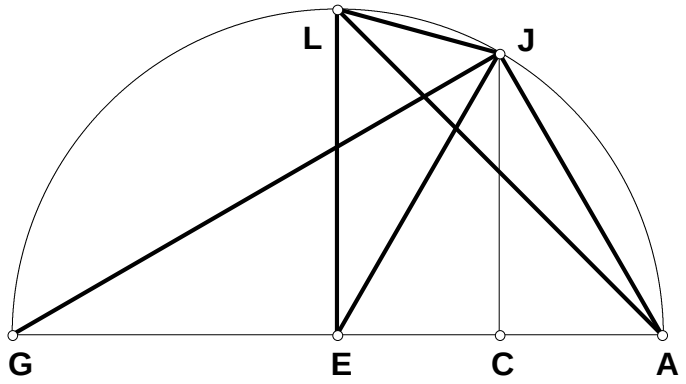
$\frac{-1}{8} + \frac{1}{8} \cdot \sqrt{5} - EM = 0 \qquad \frac{1}{2} \cdot \sqrt{\frac{5}{8} + \frac{1}{8} \cdot \sqrt{5}} - EK = 0 \qquad \frac{1}{2} - \frac{1}{8} \cdot \sqrt{10 + 2 \cdot \sqrt{5}} - KL = 0$

$\frac{1}{4} \cdot \sqrt{8 - 2 \cdot \sqrt{10 + 2 \cdot \sqrt{5}}} - LN = 0 \qquad \frac{-1}{8} + \frac{1}{8} \cdot \sqrt{5} - EG = 0 \qquad \frac{5}{8} - \frac{1}{8} \cdot \sqrt{5} - GL = 0$

$\frac{3}{8} + \frac{1}{8} \cdot \sqrt{5} - AG = 0 \qquad \frac{1}{8} \cdot \sqrt{10 + 2 \cdot \sqrt{5}} - GP = 0 \qquad \frac{1}{4} \cdot \sqrt{8 - 2 \cdot \sqrt{10 + 2 \cdot \sqrt{5}}} - PR = 0$

$\frac{1}{4} \cdot \sqrt{8 + 2 \cdot \sqrt{10 + 2 \cdot \sqrt{5}}} - AN = 0$

Outtake Four: Some Names 0507014



$AG := 1 \quad AE := \frac{AG}{2} \quad AC := \frac{AE}{2}$

$CG := AG - AC \quad CJ := \sqrt{AC \cdot CG}$

$EL := AE \quad CE := AC$

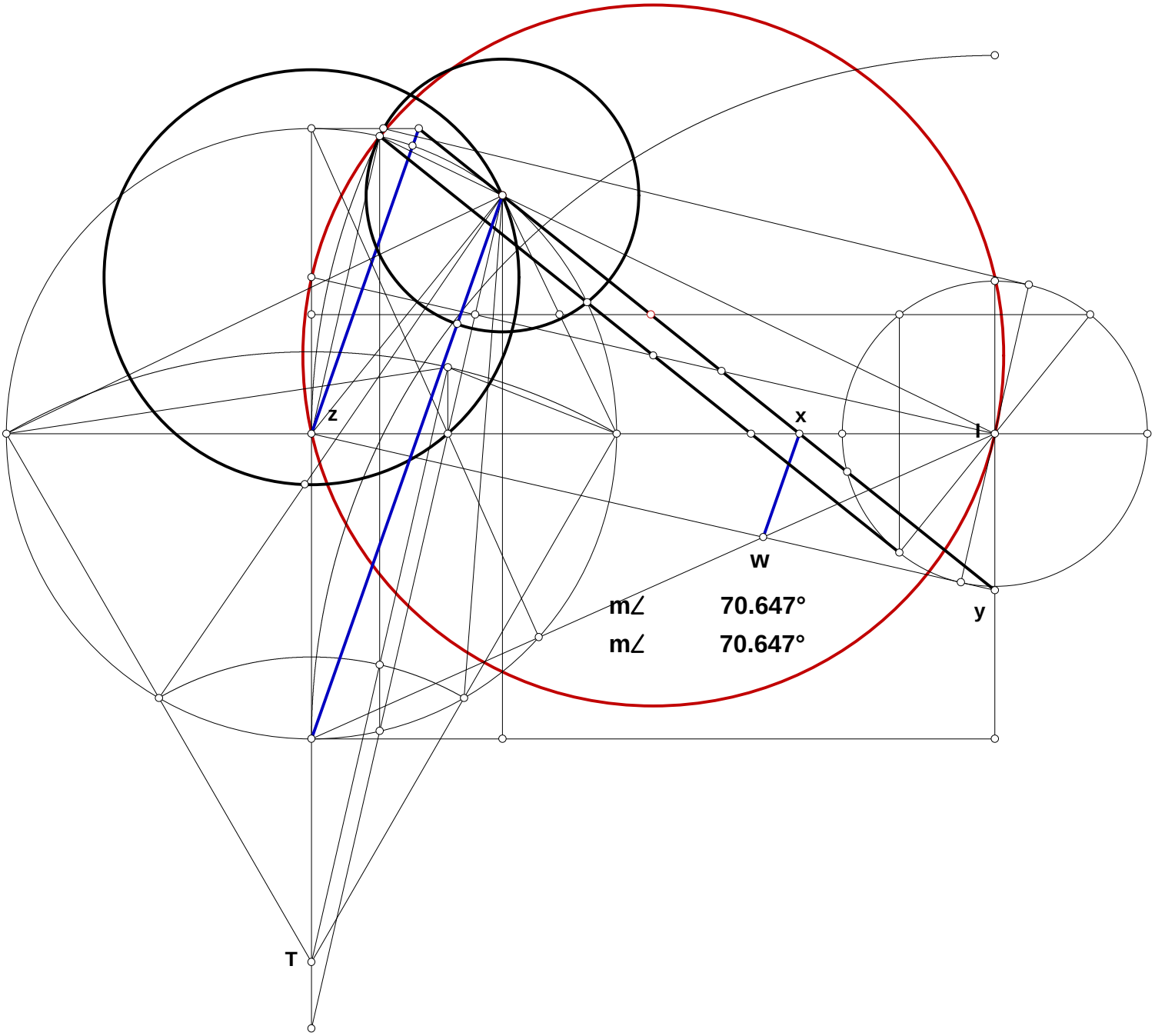
$JL := \sqrt{EL^2 - 2 \cdot EL \cdot CJ + CJ^2 + CE^2}$

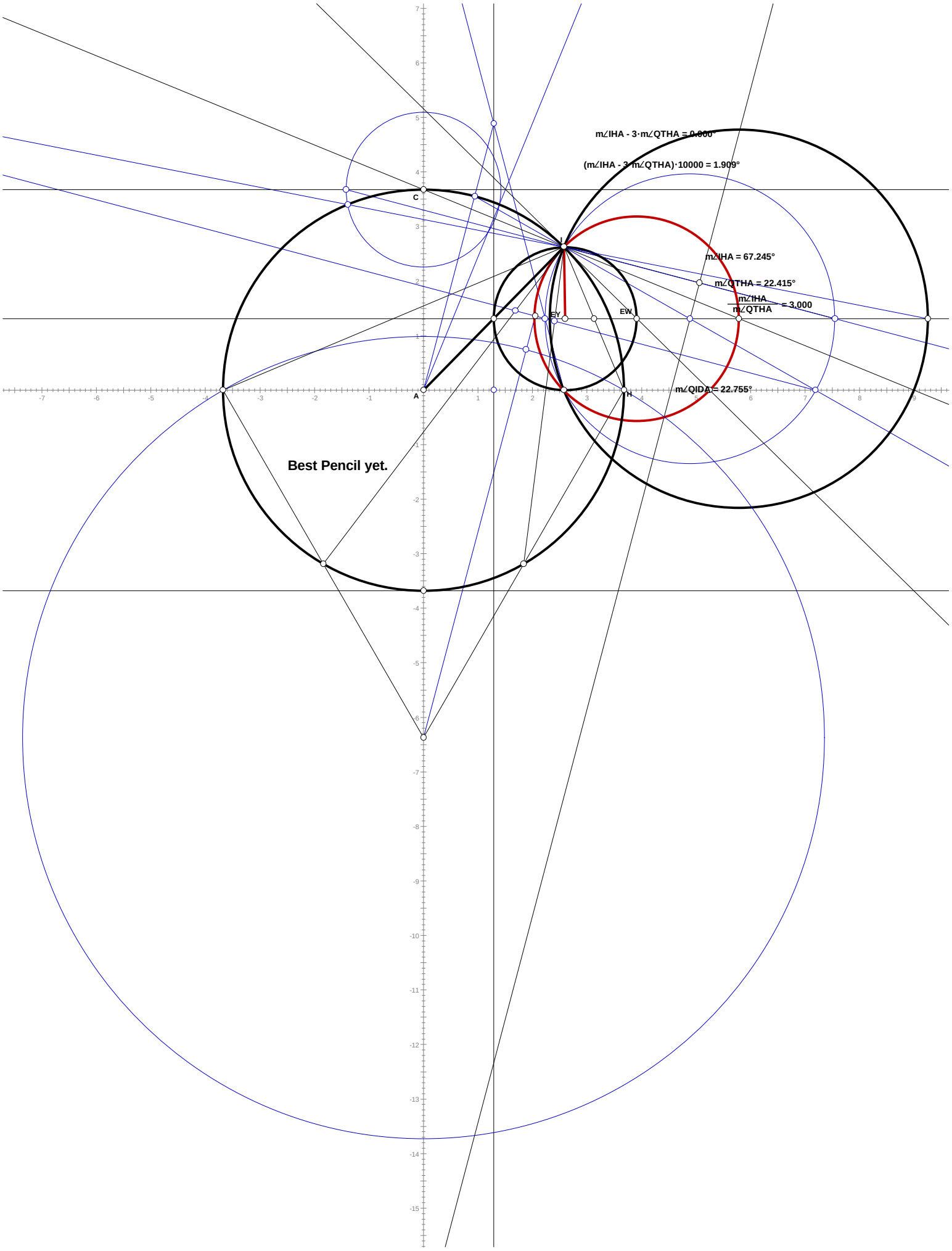
$AJ := \sqrt{AC^2 + CJ^2} \quad GJ := \sqrt{CG^2 + CJ^2}$

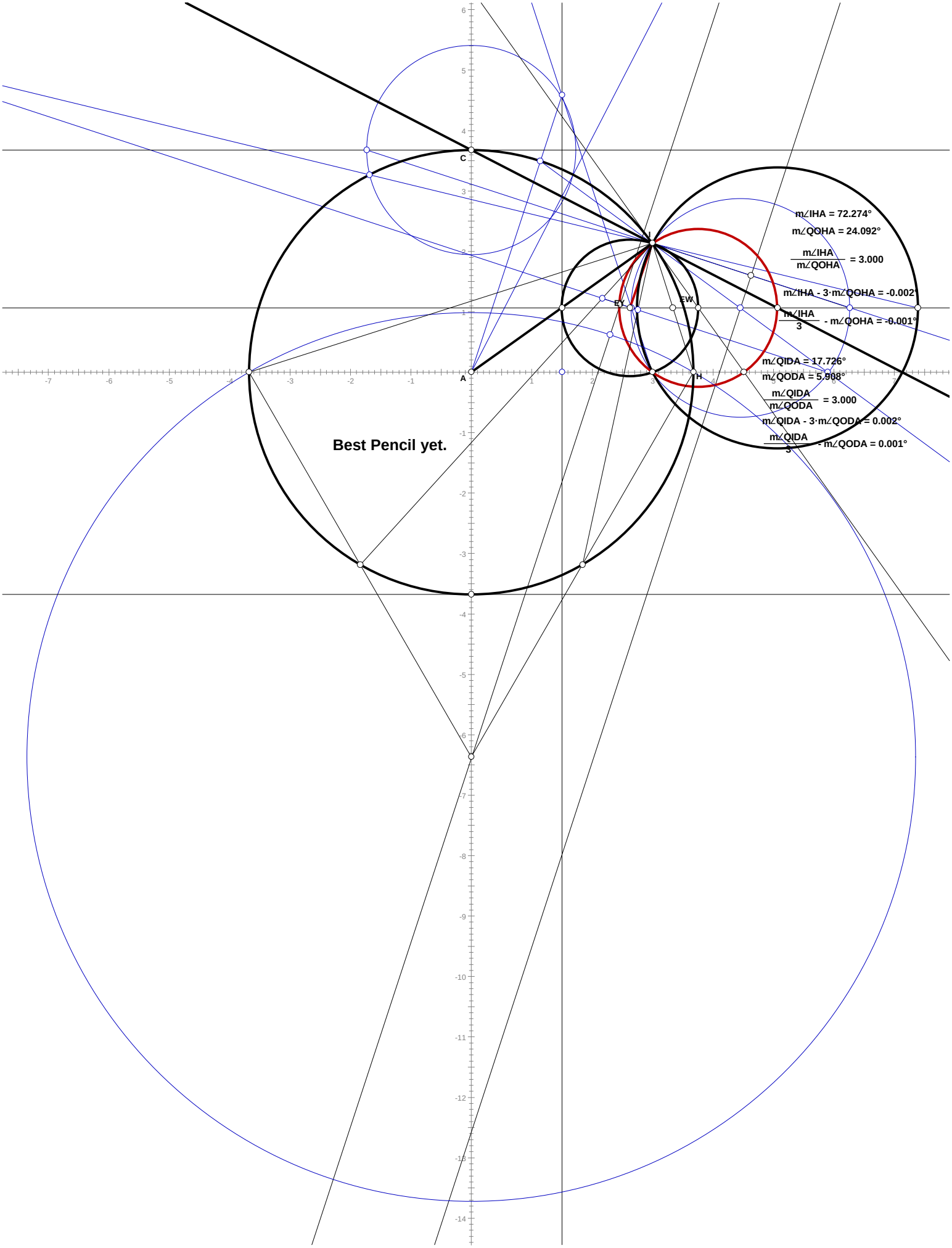
$AL := \sqrt{AE^2 + EL^2}$

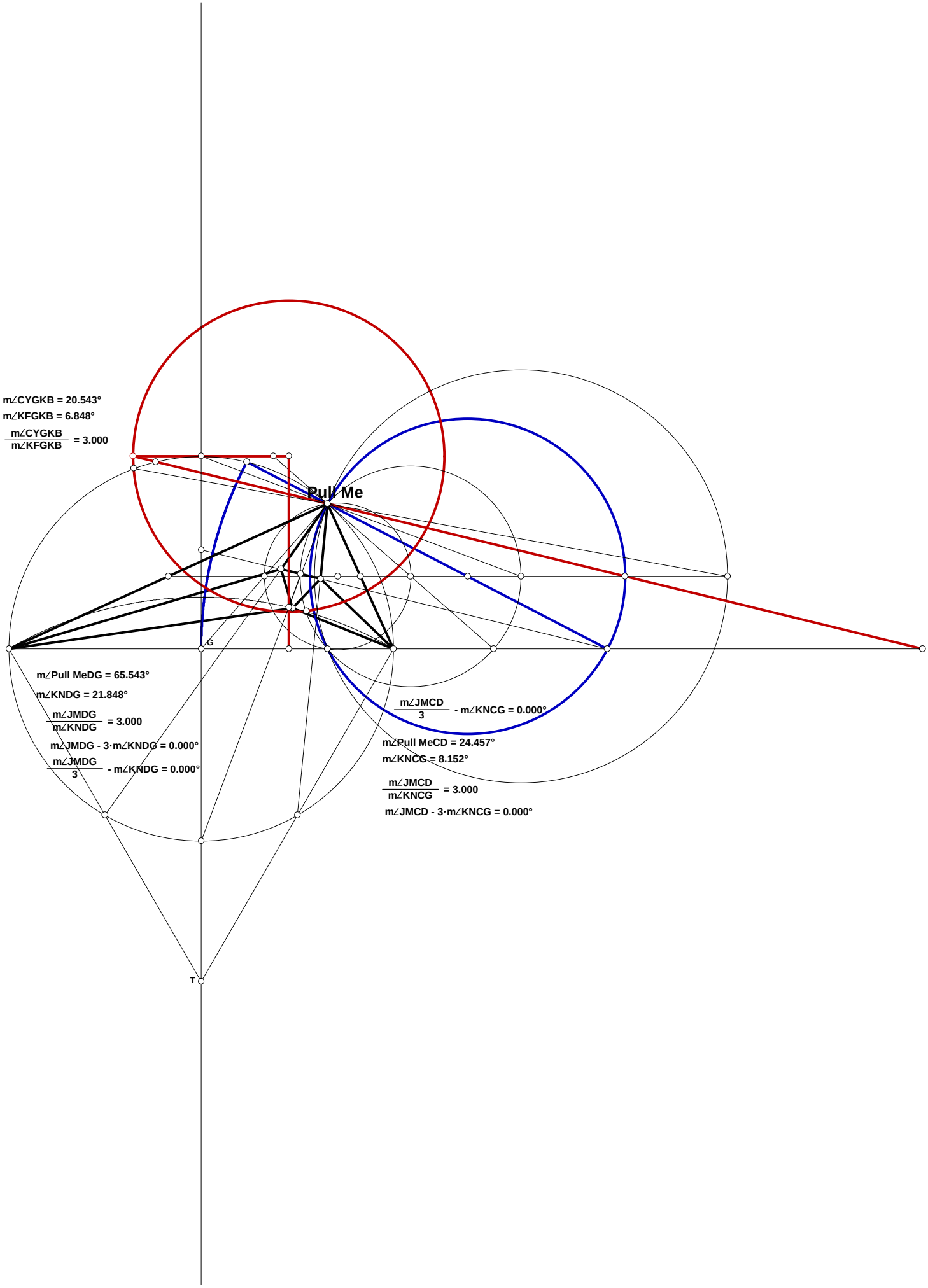
$AE := \frac{1}{2} \quad AC := \frac{1}{4} \quad CG := 1 - \frac{1}{4} \quad CJ := \frac{1}{4} \cdot \sqrt{3} \quad JL := \frac{1}{4} \cdot \sqrt{6} - \frac{1}{4} \cdot \sqrt{2}$

$AJ := \frac{1}{2} \quad GJ := \frac{1}{2} \cdot \sqrt{3}_{*} \quad AL := \frac{1}{2} \cdot \sqrt{2}$


z
x
l
w
y
T
m∠ 70.647°
m∠ 70.647°

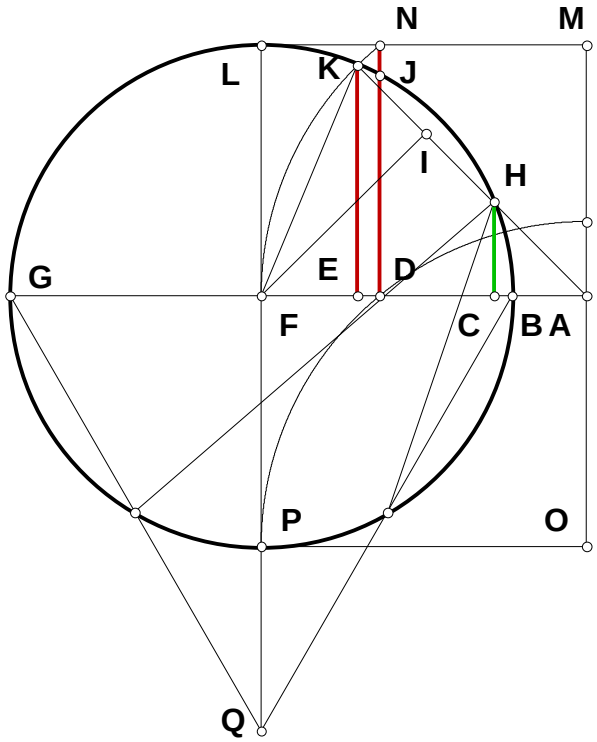

m∠IHA - 3·m∠QTHA = 0.000°
(m∠IHA - 3·m∠QTHA)·10000 = 1.909°
C
I
m∠IHA = 67.245°
m∠QTHA = 22.415°
m∠IHA / m∠QTHA = 3.000
EY
EW
H
A
m∠QIDA = 22.755°
Best Pencil yet.


C
I
EW
H
A
m∠IHA = 72.274°
m∠QOHA = 24.092°
m∠IHA / m∠QOHA = 3.000
m∠IHA - 3·m∠QOHA = -0.002°
m∠IHA / 3 - m∠QOHA = -0.001°
m∠QIDA = 17.726°
m∠QODA = 5.908°
m∠QIDA / m∠QODA = 3.000
m∠QIDA - 3·m∠QODA = 0.002°
m∠QIDA / 3 - m∠QODA = 0.001°
Best Pencil yet.


m∠CYGKB = 20.543°
m∠KFGKB = 6.848°
m∠CYGKB / m∠KFGKB = 3.000
Pull Me
G
T
m∠Pull MeDG = 65.543°
m∠KNDG = 21.848°
m∠JMDG / m∠KNDG = 3.000
m∠JMDG - 3·m∠KNDG = 0.000°
m∠JMDG / 3 - m∠KNDG = 0.000°
m∠JMCD / 3 - m∠KNCG = 0.000°
m∠Pull MeCD = 24.457°
m∠KNCG = 8.152°
m∠JMCD / m∠KNCG = 3.000
m∠JMCD - 3·m∠KNCG = 0.000°

On Trisection 051301

For any given trisection what is the Algebraic names of BC and BE taking BG as unit?



$N := 9 \qquad BG := 1 \qquad AG := BG \cdot N$

$AB := AG - BG \qquad BF := \frac{BG}{2}$

$AF := AB + BF \qquad AN := AF \qquad AK := AN$

$FK := BF \qquad S_1 := AF \qquad S_2 := AK \qquad S_3 := FK$

$AE := \frac{S_2^2 + S_1^2 - S_3^2}{2 \cdot S_1} \qquad AI := AE$

$IK := AK - AI \qquad HI := IK \qquad AH := AK - (HI + IK)$

$AC := \frac{AE \cdot AH}{AK} \qquad BC := AC - AB \qquad BE := AE - AB$

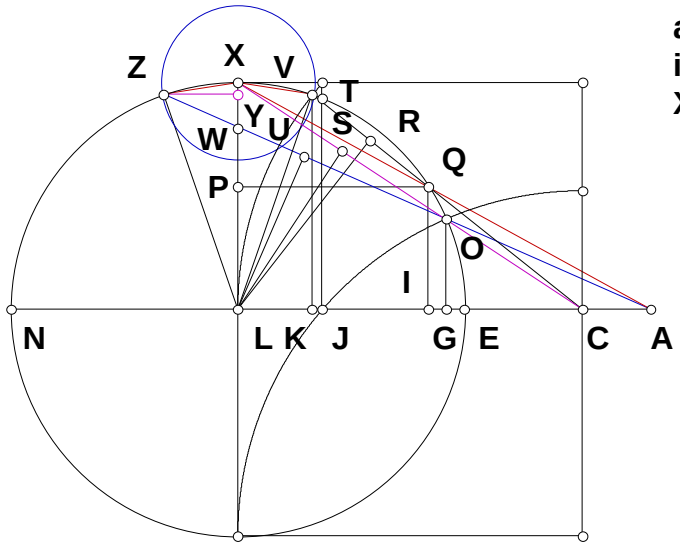
Some Algebraic Names:

$N - 1 - AB = 0 \qquad \frac{1}{2} - BF = 0 \qquad \frac{1}{2} \cdot (2 \cdot N - 1) - AF = 0 \qquad \frac{1}{4} \cdot \frac{\left(8 \cdot N^2 - 8 \cdot N + 1\right)}{(2 \cdot N - 1)} - AE = 0$

$\frac{1}{4} \cdot \frac{1}{(2 \cdot N - 1)} - IK = 0 \qquad 2 \cdot N \cdot \frac{(N - 1)}{(2 \cdot N - 1)} - AH = 0 \qquad \frac{\left(8 \cdot N^2 - 8 \cdot N + 1\right)}{(2 \cdot N - 1)^3} \cdot N \cdot (N - 1) - AC = 0$

$(N - 1)^2 \cdot \frac{(4 \cdot N - 1)}{(2 \cdot N - 1)^3} - BC = 0 \qquad \frac{1}{4} \cdot \frac{(-3 + 4 \cdot N)}{(2 \cdot N - 1)} - BE = 0$

On Trisection 051401.MCD



For any given QLX, XLZ is 1/3 of that angle. What are the Algebraic names in this figure for the cords QX and XZ?

$N := 5 \quad CE := 1 \quad CN := CE \cdot N$

$EN := CN - CE \quad EL := \frac{EN}{2} \quad LV := EL$

$CL := CE + EL$

$CV := CL \quad S_1 := CL \quad S_2 := CV$

$S_3 := LV \quad CK := \frac{S_2^2 + S_1^2 - S_3^2}{2 \cdot S_1}$

$CR := CK \quad RV := CV - CR \quad QR := RV \quad CQ := CV - (QR + RV) \quad CI := \frac{CK \cdot CQ}{CV} \quad EI := CI - CE$

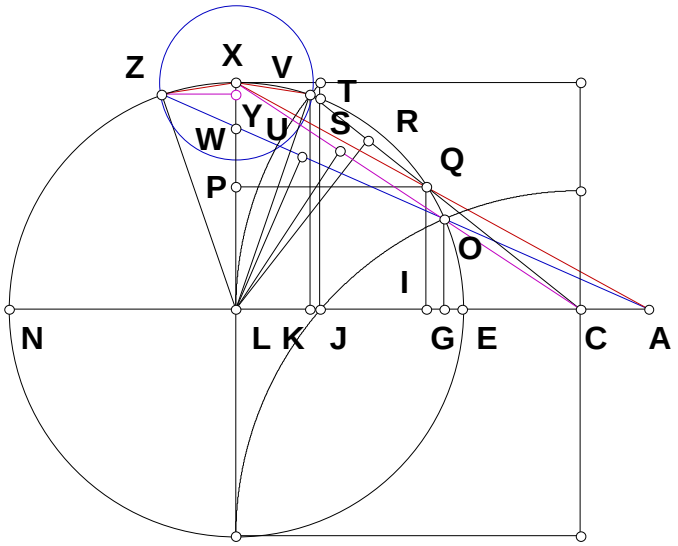
$IN := EN - EI \quad IQ := \sqrt{EI \cdot IN} \quad LP := IQ \quad LX := EL \quad IL := EL - EI \quad PX := LX - LP \quad AL := \frac{IL \cdot LX}{PX}$

$AE := AL - EL \quad AC := AE - CE \quad AI := AC + CI \quad AX := \sqrt{AL^2 + LX^2} \quad AQ := \frac{AX \cdot AI}{AL} \quad QX := AX - AQ$

$CX := \sqrt{CL^2 + LX^2} \quad CS := \frac{CL^2}{CX} \quad SX := CX - CS \quad OS := SX \quad CO := CX - (SX + OS)$

$GO := \frac{LX \cdot CO}{CX} \quad CG := \frac{CL \cdot CO}{CX} \quad EG := CG - CE \quad AG := AE + EG \quad AO := \sqrt{AG^2 + GO^2}$

$AU := \frac{AG \cdot AL}{AO} \quad OU := AU - AO \quad UZ := OU \quad AZ := AO + (OU + UZ)$



$$LW := \frac{GO \cdot AL}{AG} \qquad AW := \frac{AO \cdot AL}{AG}$$

$$WZ := AZ - AW \qquad WY := \frac{GO \cdot WZ}{AO}$$

$$YZ := \frac{AG \cdot WZ}{AO} \qquad YX := LX - (LW + WY)$$

$$XZ := \sqrt{YX^2 + YZ^2}$$

Some Algebraic Names:

$$\frac{1}{2} \cdot CE \cdot N - \frac{1}{2} \cdot CE - EL = 0 \qquad \frac{1}{4} \cdot CE \cdot \frac{\left(1 + 6 \cdot N + N^2\right)}{(1 + N)} - CK = 0 \qquad \frac{1}{4} \cdot CE \cdot \frac{\left(1 + N^2 - 2 \cdot N\right)}{(1 + N)} - RV = 0$$

$$2 \cdot CE \cdot \frac{N}{(1 + N)} - CQ = 0 \qquad CE \cdot \frac{N^3 + 6\,N^2 + N}{(N + 1)^3} - CE - EI = 0 \qquad CE \cdot \frac{\left(1 + 6 \cdot N + N^2\right)}{(1 + N)^3} \cdot N - CI = 0$$

$$CE \cdot N^2 \cdot \frac{\left(-3 + 2 \cdot N + N^2\right)}{(1 + N)^3} - IN = 0 \qquad (N - 1) \cdot N \cdot CE \cdot \frac{\sqrt{(N + 3) \cdot (3 \cdot N + 1)}}{(1 + N)^3} - IQ = 0$$

$$\frac{1}{2} \cdot CE \cdot \frac{\left(2 \cdot N - 6 \cdot N^2 + 2 \cdot N^3 + N^4 + 1\right)}{(1 + N)^3} - IL = 0$$

$$\left[\frac{1}{2} \cdot CE \cdot (N - 1) \cdot \frac{\left[N^3 + 3 \cdot N^2 - 2 \cdot N \cdot \sqrt{(N + 3) \cdot (3 \cdot N + 1)} + 3 \cdot N + 1\right]}{(1 + N)^3}\right] - PX = 0$$

$$\frac{1}{2}\cdot CE\cdot\left(N^2+4\cdot N+1\right)\cdot\frac{(N-1)^2}{\left[N^3+3\cdot N^2-2\cdot N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}+3\cdot N+1\right]}-AL=0$$

$$CE\cdot(N-1)\cdot\frac{\left[N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}-3\cdot N-1\right]}{\left[N^3+3\cdot N^2-2\cdot N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}+3\cdot N+1\right]}-AE=0$$

$$-CE\cdot N\cdot\frac{\left[-N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}+6\cdot N+1-\sqrt{(N+3)\cdot(3\cdot N+1)}+N^2\right]}{\left[N^3+3\cdot N^2-2\cdot N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}+3\cdot N+1\right]}-AC=0$$

$$\frac{CE\cdot(N-1)^2\cdot N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot\left(N^2+4\cdot N+1\right)}{\left[N^3+3\cdot N^2-2\cdot N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}+3\cdot N+1\right]\cdot(1+N)^3}-AI=0$$

$$\frac{1}{2}\cdot CE\cdot(N-1)\cdot\sqrt{2}\cdot\sqrt{\frac{(1+N)^3}{\left[N^3+3\cdot N^2-2\cdot N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}+3\cdot N+1\right]}}-AX=0$$

$$CE\cdot(N-1)\cdot\sqrt{2}\cdot\sqrt{\frac{(1+N)^3}{\left[N^3+3\cdot N^2-2\cdot N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}+3\cdot N+1\right]}}\cdot N\cdot\frac{\sqrt{(N+3)\cdot(3\cdot N+1)}}{(1+N)^3}-AQ=0$$

$$\sqrt{\frac{\left[2\cdot(1+N)^3\right]}{\left[N^3+3\cdot N^2-2\cdot N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\ \ldots\right.}}\cdot CE\cdot(N-1)\cdot\frac{\left[\left(N^3+3\cdot N^2\right)-2\cdot N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\ \ldots\right.}{2\cdot(1+N)^3}\ \ldots=0$$

$$\left.+3\cdot N+1\right]$$

$$\left.+3\cdot N+1\right]$$

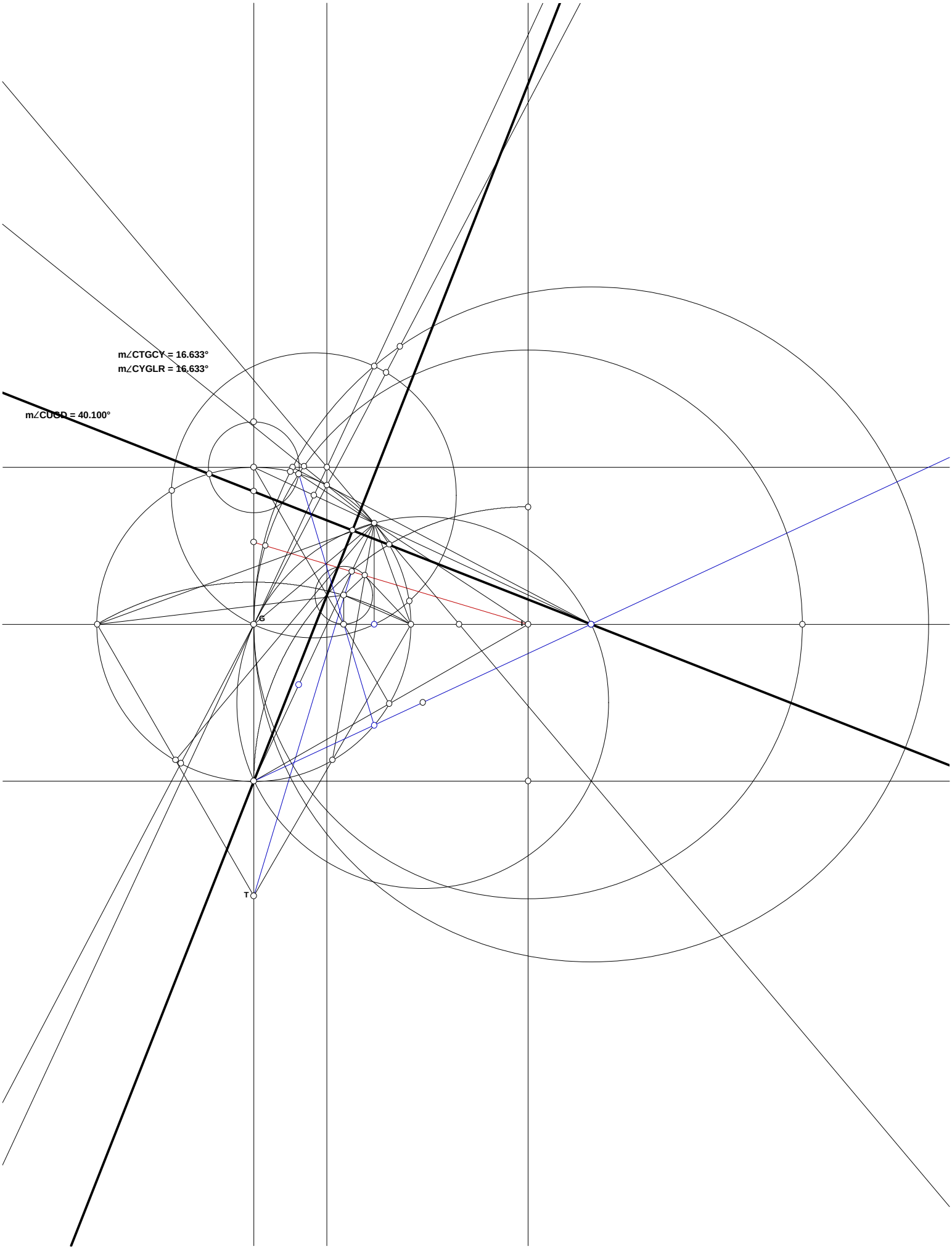
$$+-QX$$

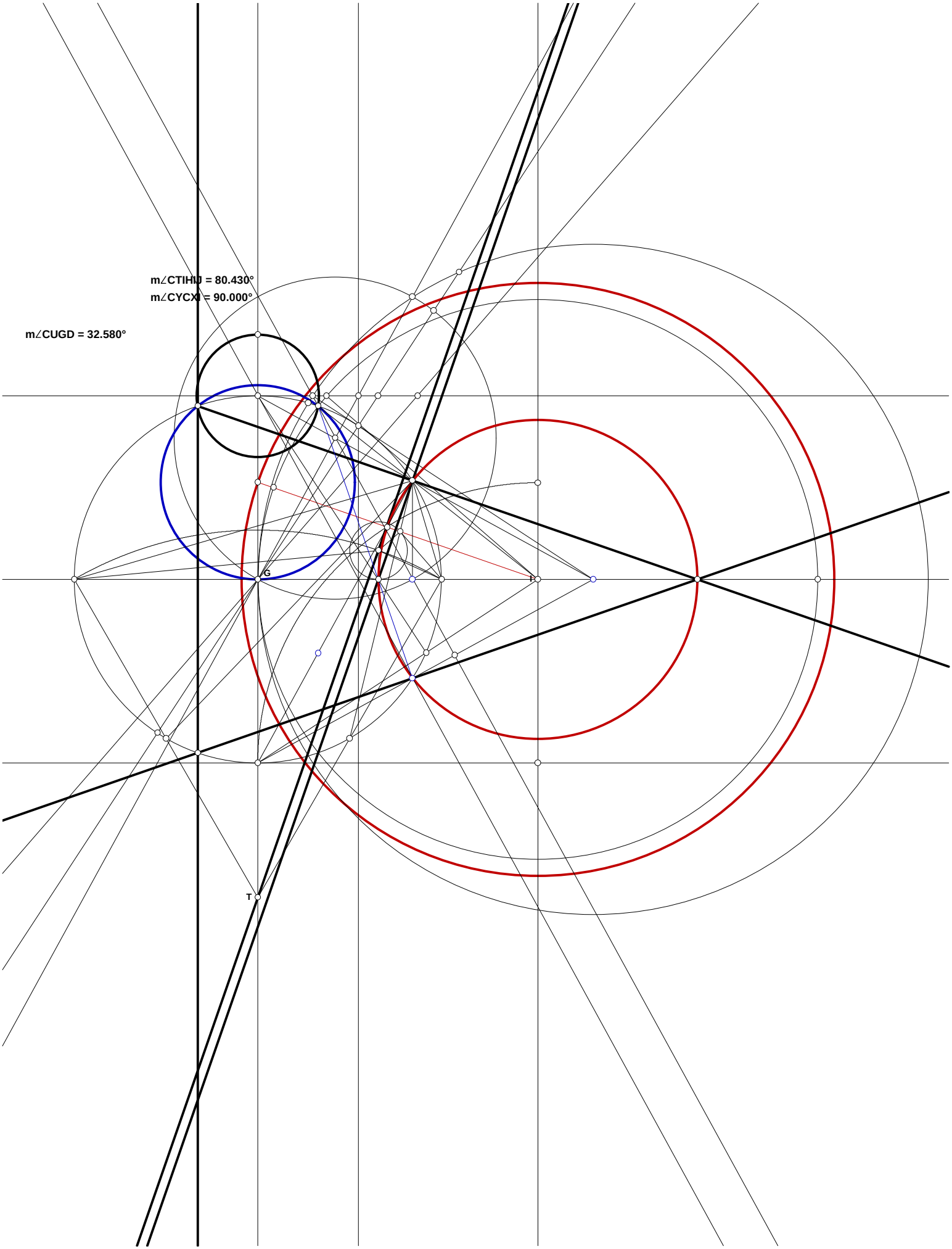
$$\frac{CE}{2}\cdot\sqrt{2}\cdot\sqrt{\left(1+N^2\right)}-CX=0 \qquad \frac{1}{4}\cdot CE\cdot(1+N)^2\cdot\frac{\sqrt{2}}{\sqrt{1+N^2}}-CS=0 \qquad \frac{1}{4}\cdot\sqrt{2}\cdot CE\cdot\frac{(N-1)^2}{\sqrt{1+N^2}}-SX=0$$

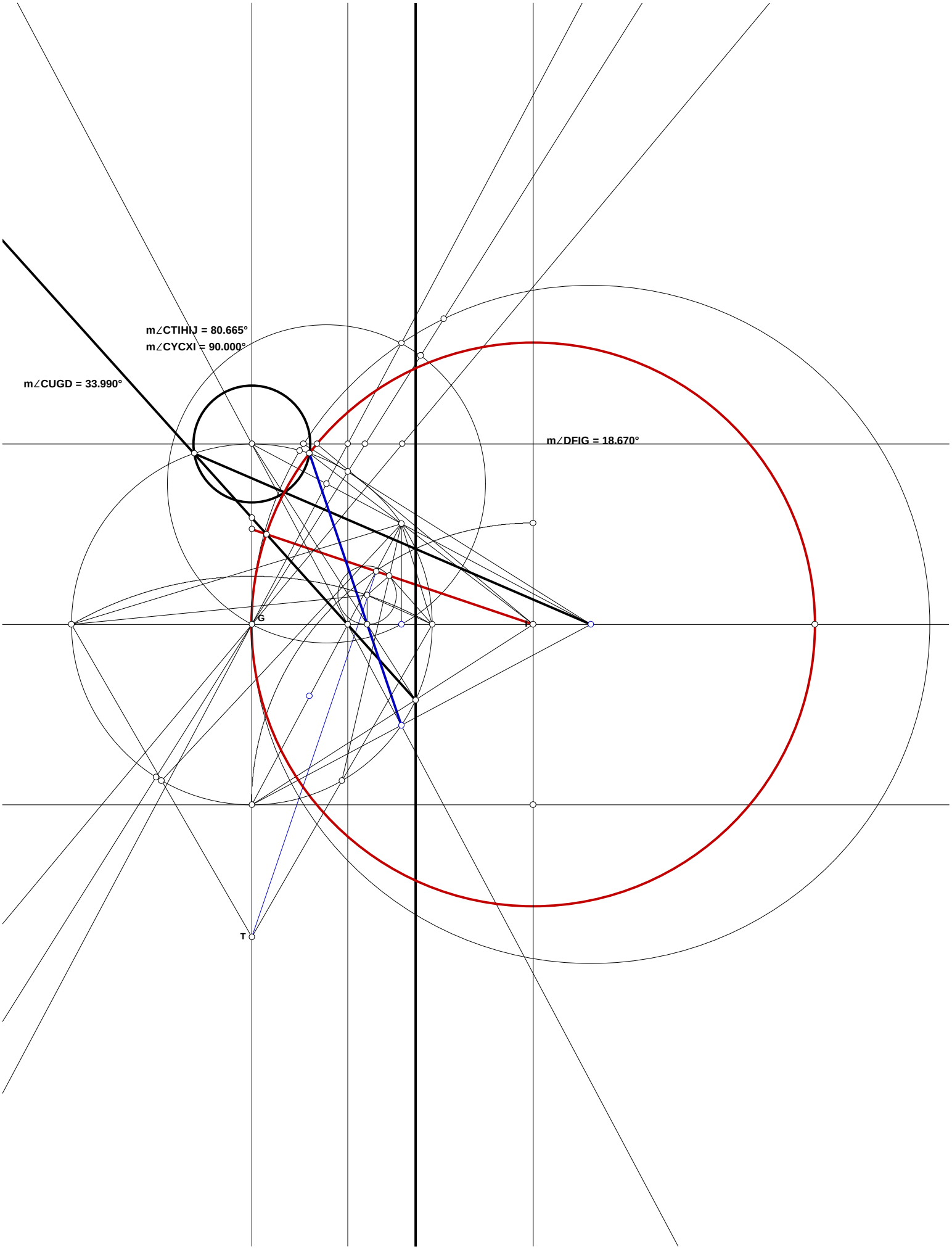
$$\frac{\sqrt{2}}{\sqrt{1+N^2}}\cdot CE\cdot N-CO=0 \qquad CE\cdot N\cdot\frac{(N-1)}{\left(1+N^2\right)}-GO=0 \qquad CE\cdot\frac{N^2+N}{\left(1+N^2\right)}-CG=0 \qquad CE\cdot\frac{(N-1)}{\left(1+N^2\right)}-EG=0$$

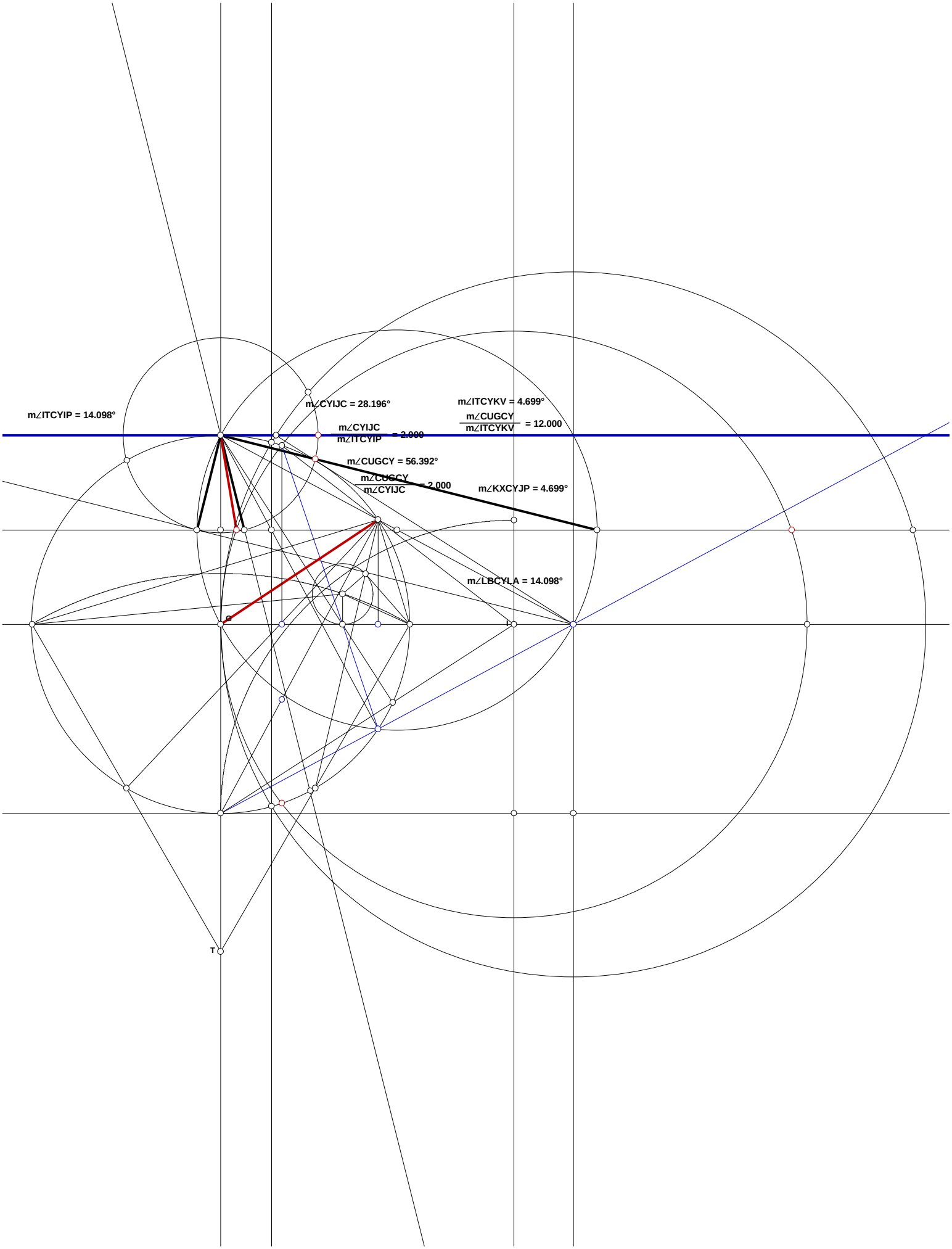
$$CE\cdot(N-1)^2\cdot N\cdot\frac{\left[N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}-2\cdot N+\sqrt{(N+3)\cdot(3\cdot N+1)}\right]}{\left[\left[N^3+3\cdot N^2-2\cdot N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}+3\cdot N+1\right]\cdot\left(1+N^2\right)\right]}-AG=0$$

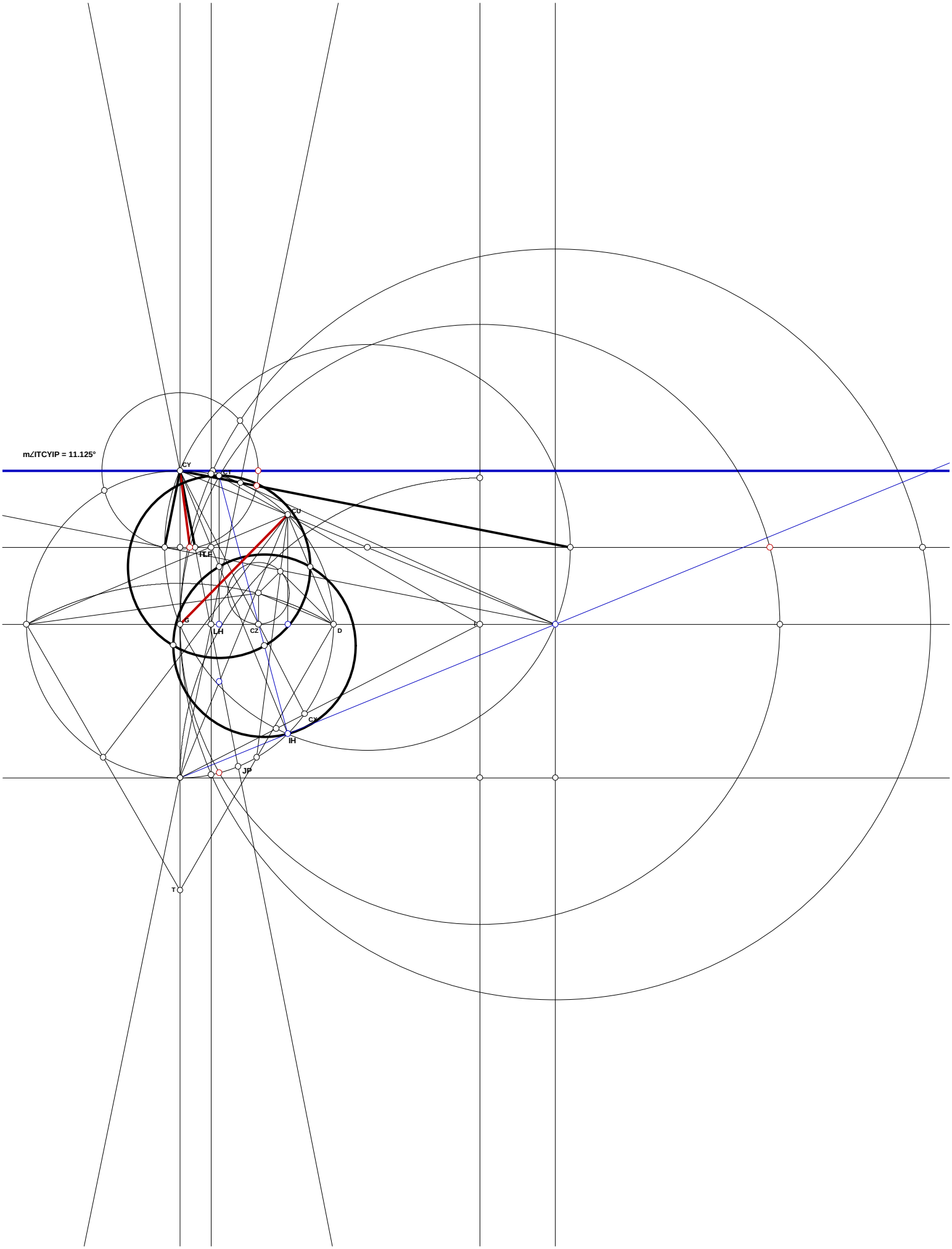
$$\frac{CE\cdot(N-1)}{2}\cdot\sqrt{\frac{\left[\begin{array}{l}\left[2\cdot N^4+14\cdot N^3-N^3\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}+32\cdot N^2\right]-7\cdot N^2\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\ \ldots\\ +\,-7\cdot N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}+14\cdot N+2-\sqrt{(N+3)\cdot(3\cdot N+1)}\end{array}\right]}{\left[(1+N)\cdot\left[N^3+3\cdot N^2-2\cdot N\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}+3\cdot N+1\right]\right]}}-XZ=0$$

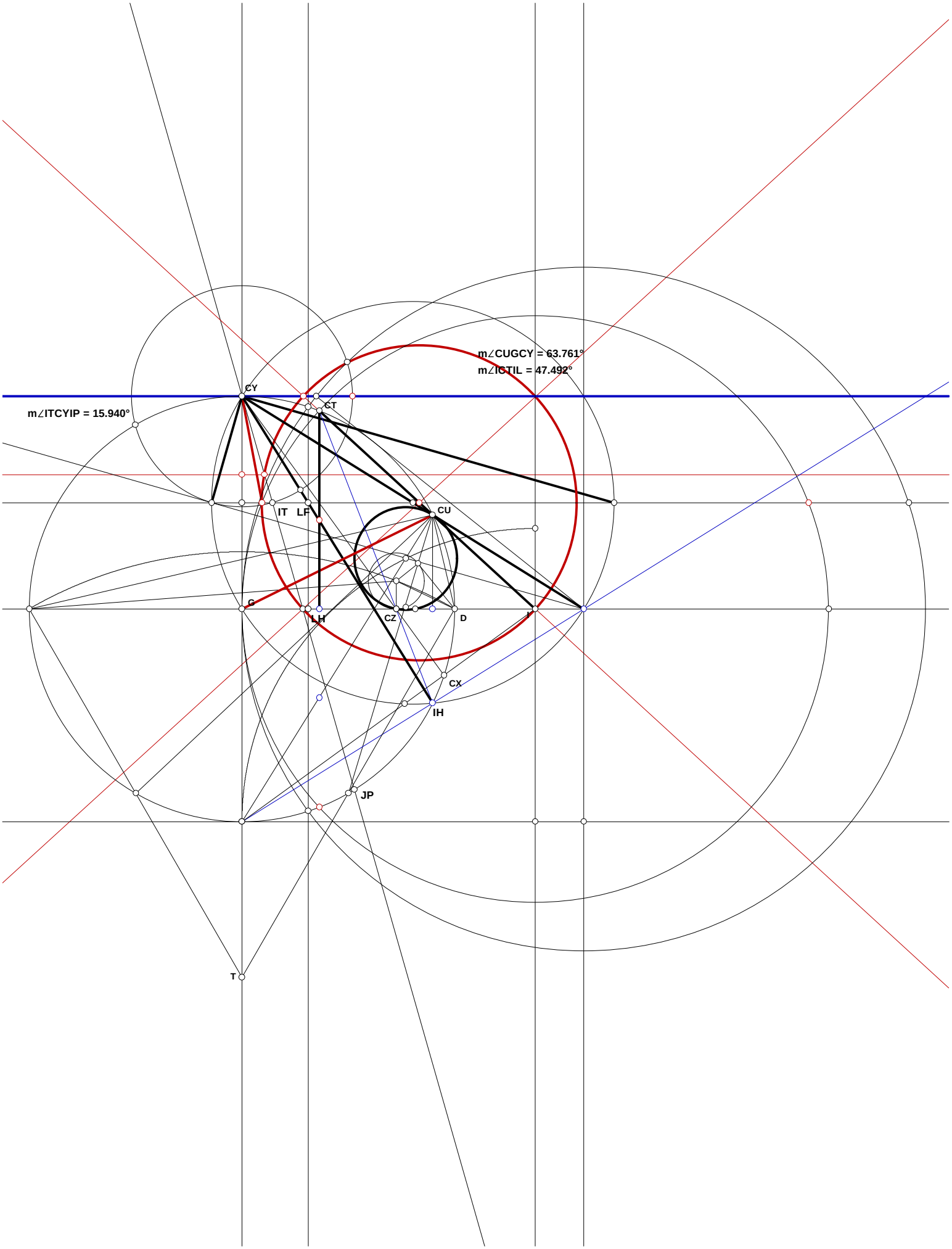

m∠CTGCY = 16.633°
m∠CYGLR = 16.633°
m∠CUGD = 40.100°
G
T

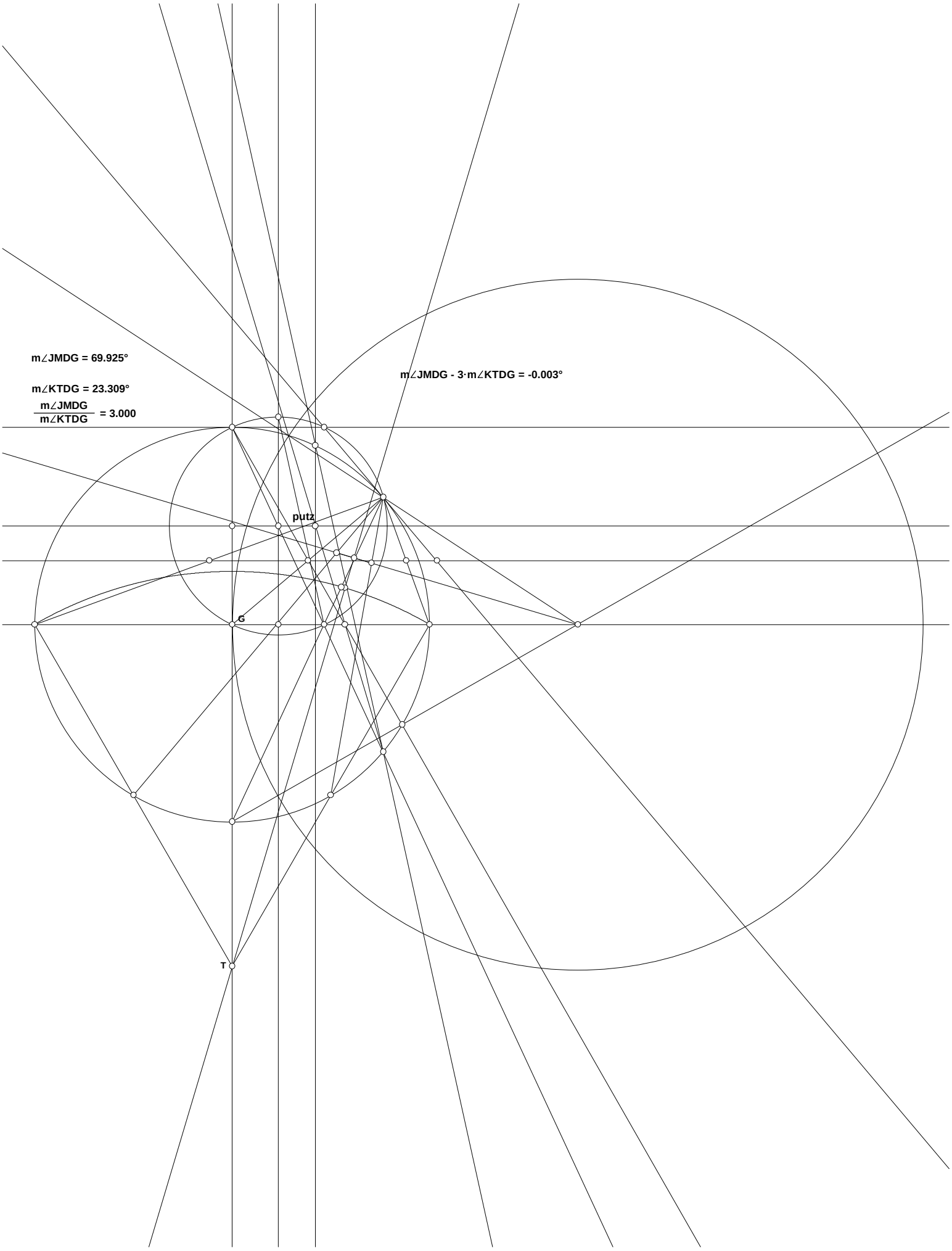

m∠CTIHIJ = 80.430°
m∠CYCX = 90.000°
m∠CUGD = 32.580°
G
I
T

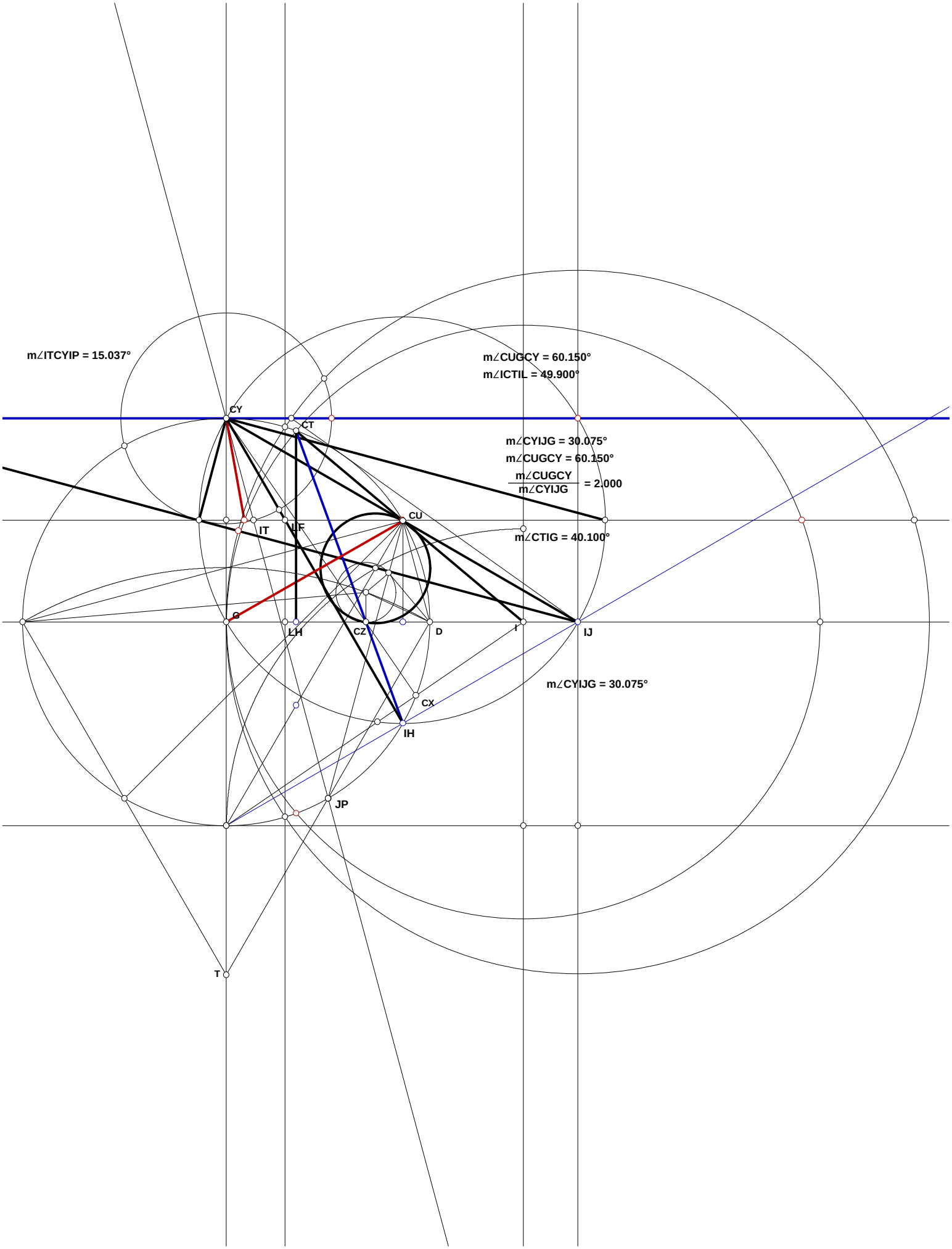

m∠CTIHIJ = 80.665°
m∠CYCXI = 90.000°
m∠CUGD = 33.990°
m∠DFIG = 18.670°
G
T

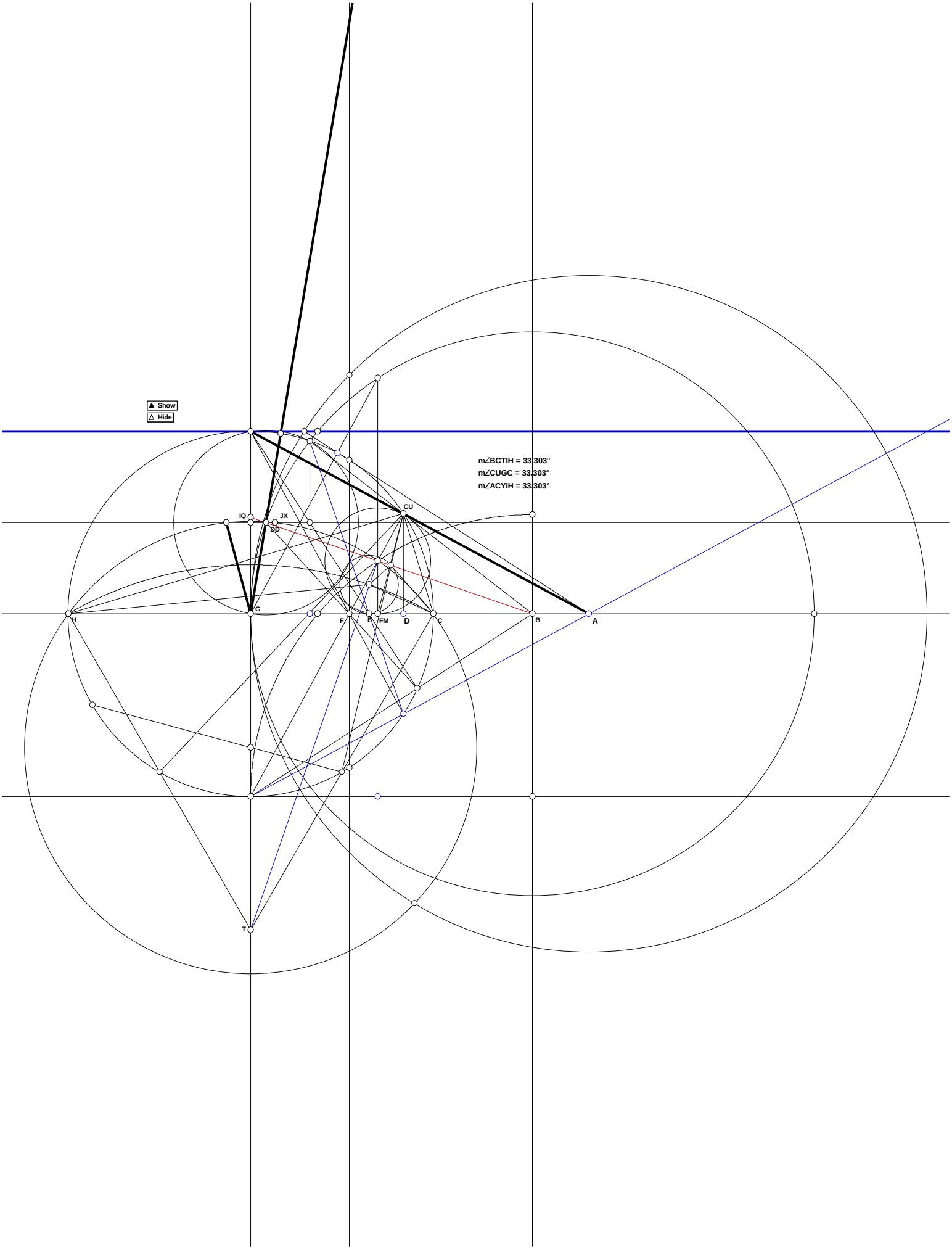

m∠ITCYIP = 14.098°
m∠CYIJC = 28.196°
m∠ITCYKV = 4.699°
m∠CUGCY / m∠ITCYKV = 12.000
m∠CYIJC / m∠ITCYIP = 2.000
m∠CUGCY = 56.392°
m∠CUGCY / m∠CYIJC = 2.000
m∠KXCYJP = 4.699°
m∠LBCYLA = 14.098°
G
I
T

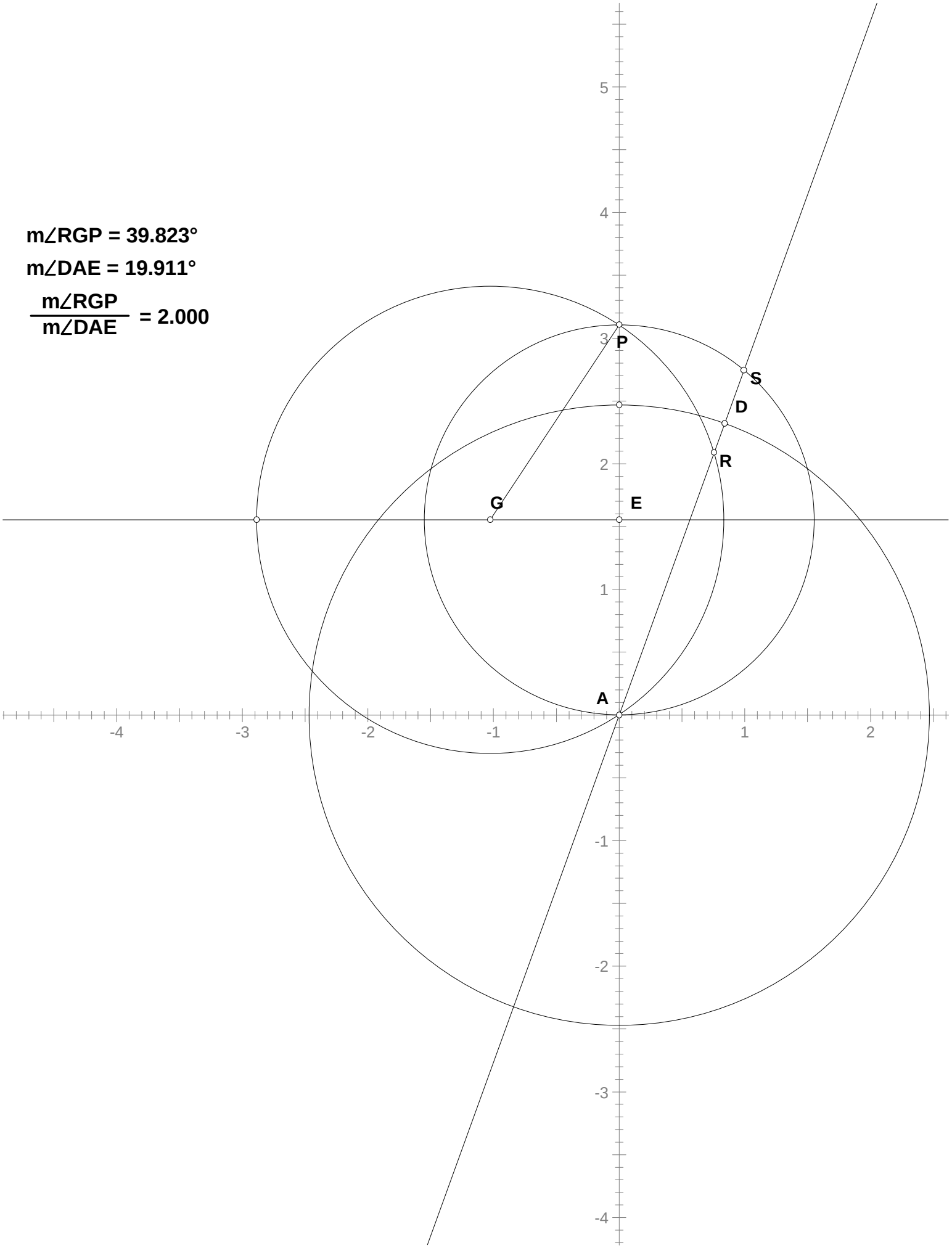

m∠ITCYIP = 11.125°
CY
CT
CO
ITLE
C
LH
CZ
D
CX
IH
JP
T

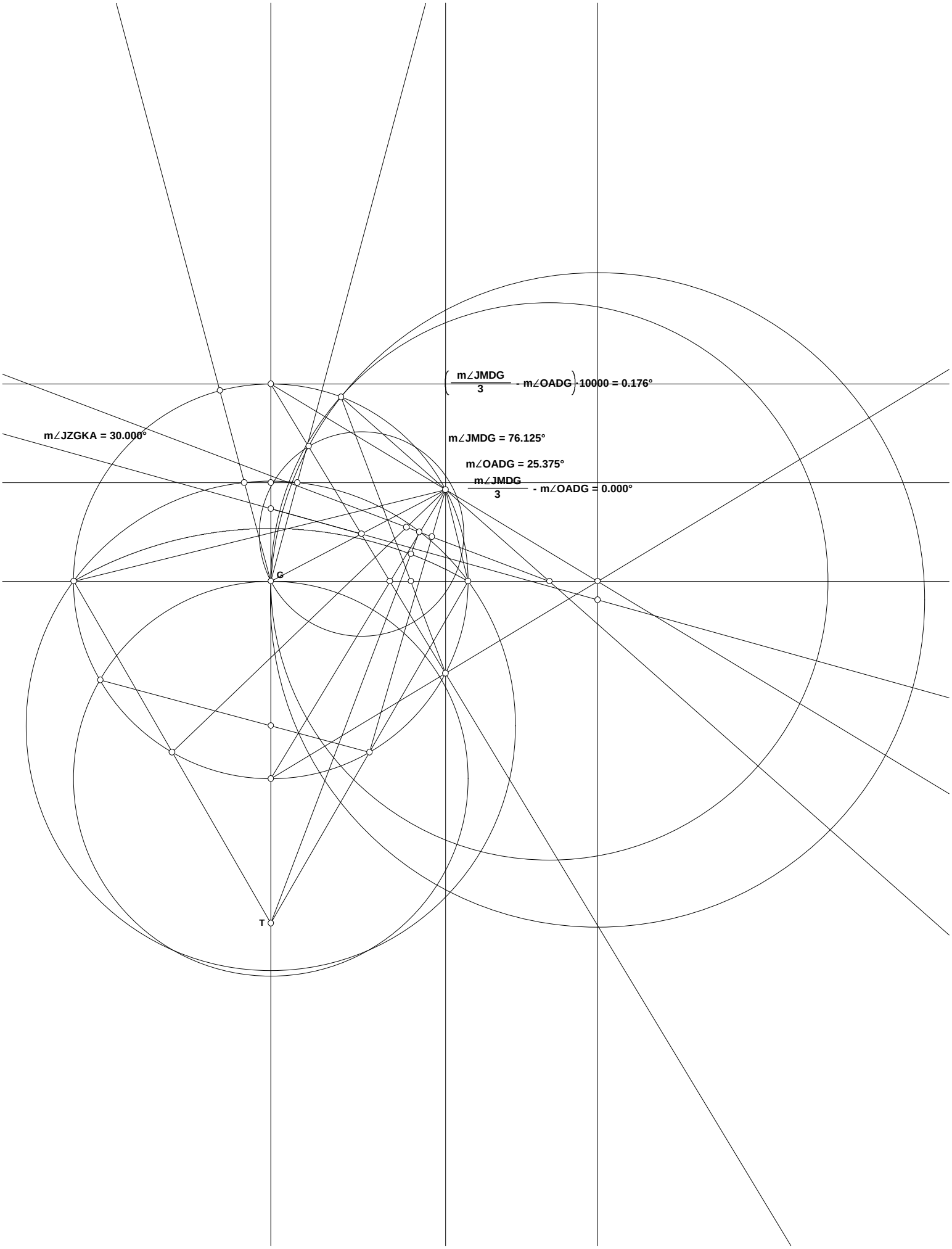

m∠CUGCY = 63.761°
m∠ICTIL = 47.492°
m∠ITCYIP = 15.940°
CY
CT
IT
LF
CU
C
LH
CZ
D
I
CX
IH
JP
T

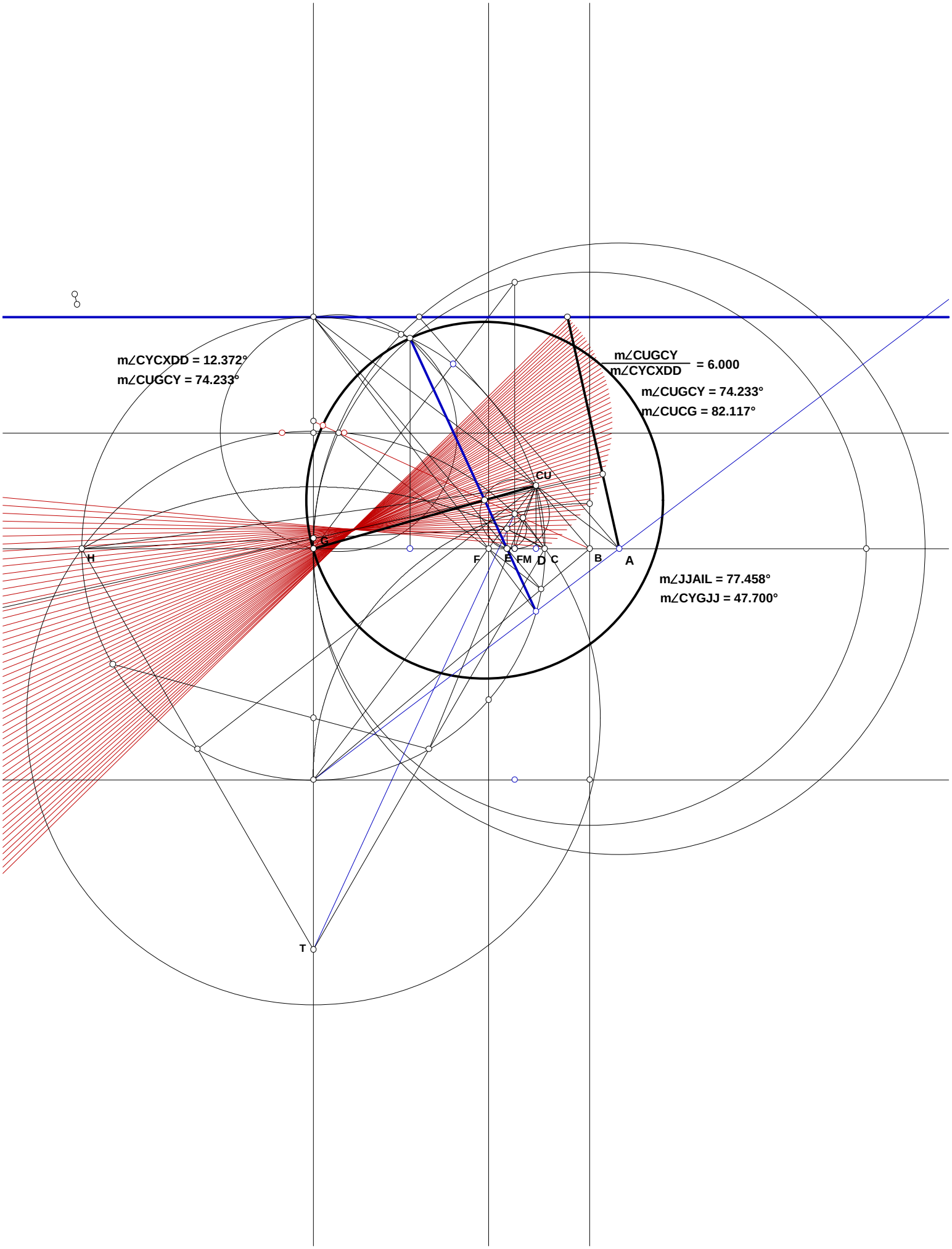

m∠JMDG = 69.925°
m∠KTDG = 23.309°
m∠JMDG / m∠KTDG = 3.000
m∠JMDG - 3·m∠KTDG = -0.003°
putz
G
T

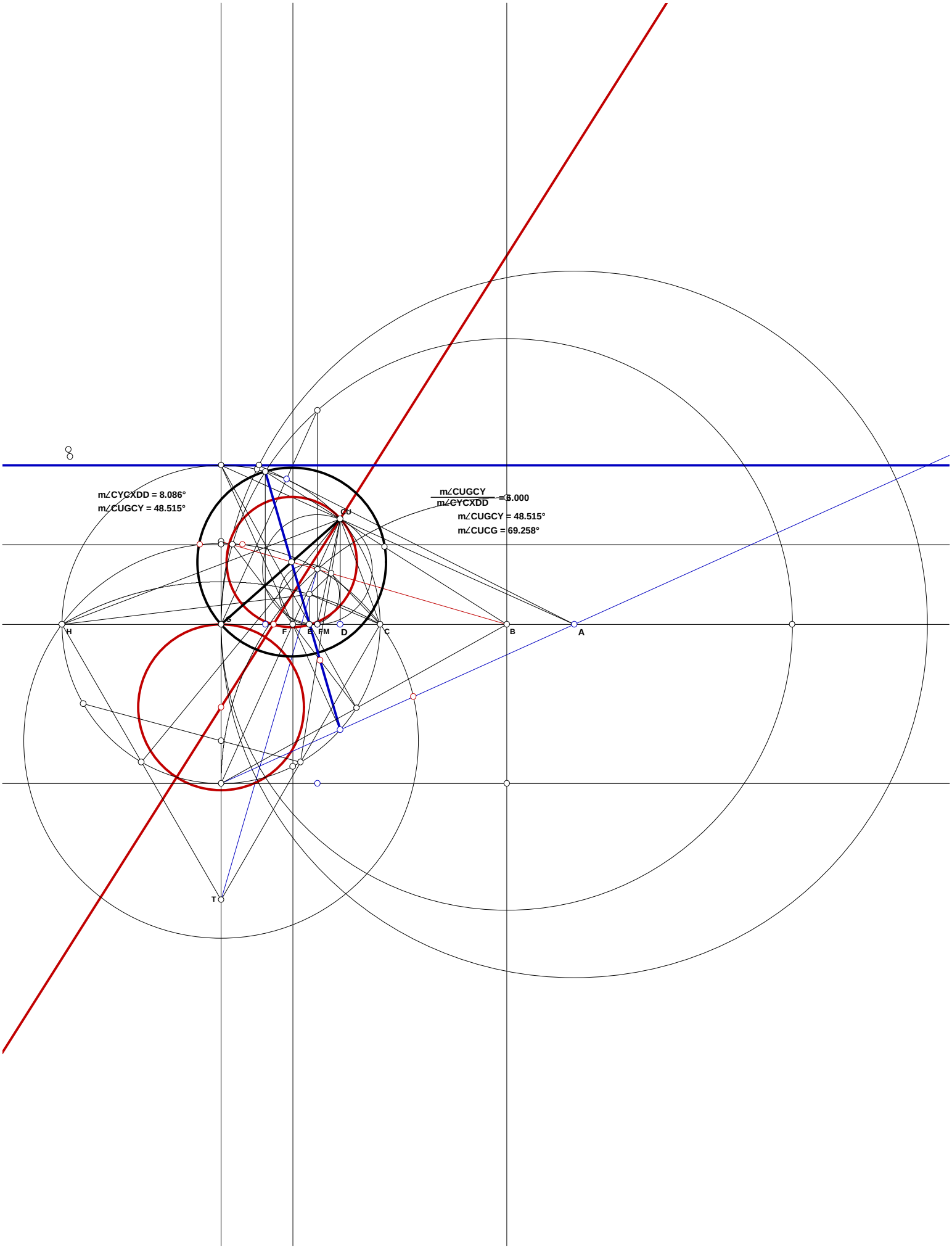

m∠ITCYIP = 15.037°
m∠CUGCY = 60.150°
m∠ICTIL = 49.900°
CY
CT
m∠CYIJG = 30.075°
m∠CUGCY = 60.150°
m∠CUGCY / m∠CYIJG = 2.000
CU
IT
LF
m∠CTIG = 40.100°
G
LH
CZ
D
I
IJ
m∠CYIJG = 30.075°
CX
IH
JP
T

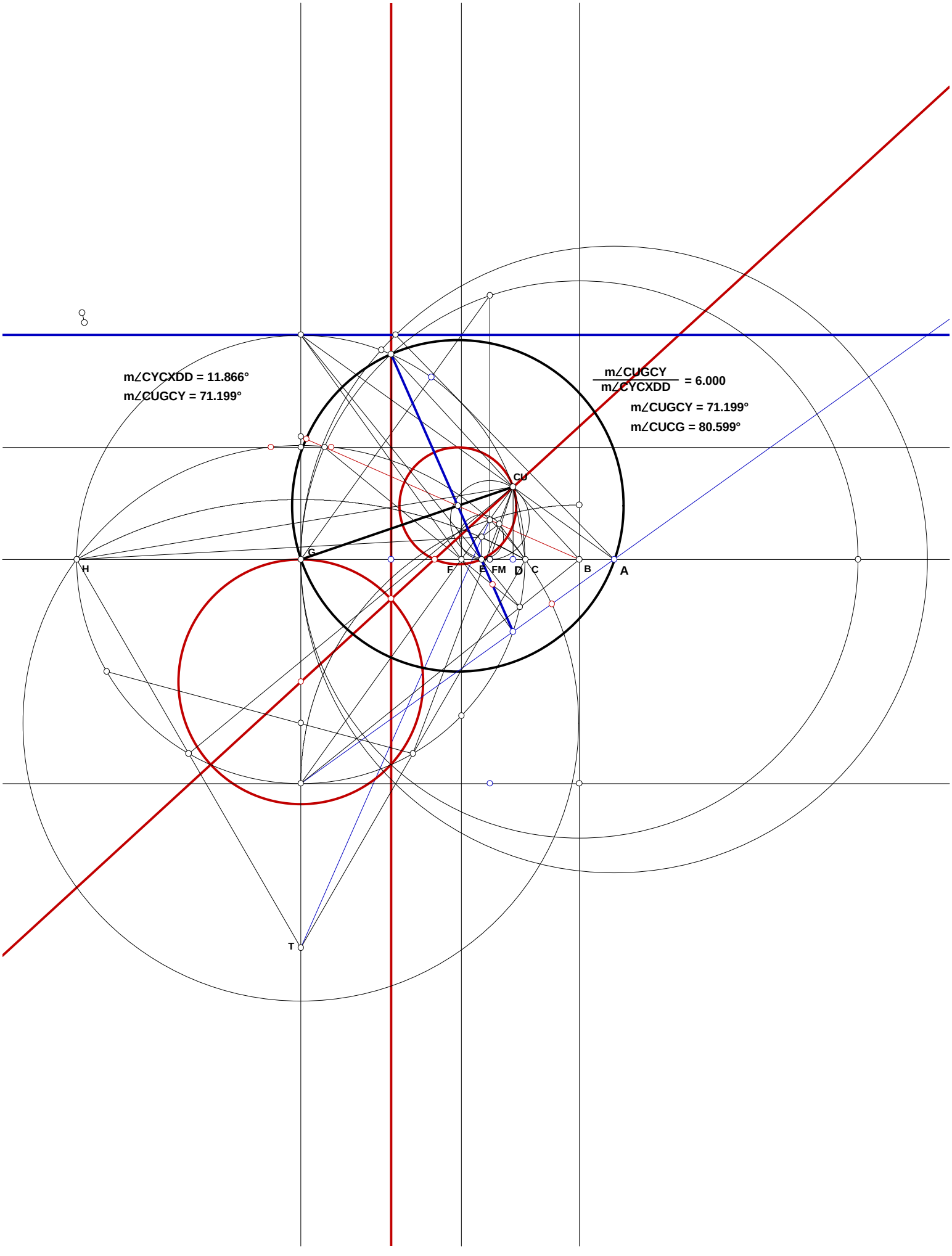

Show
Hide
m∠BCTIH = 33.303°
m∠CUGC = 33.303°
m∠ACYIH = 33.303°
IQ
JX
DD
CU
G
H
F
E
FM
D
C
B
A
T

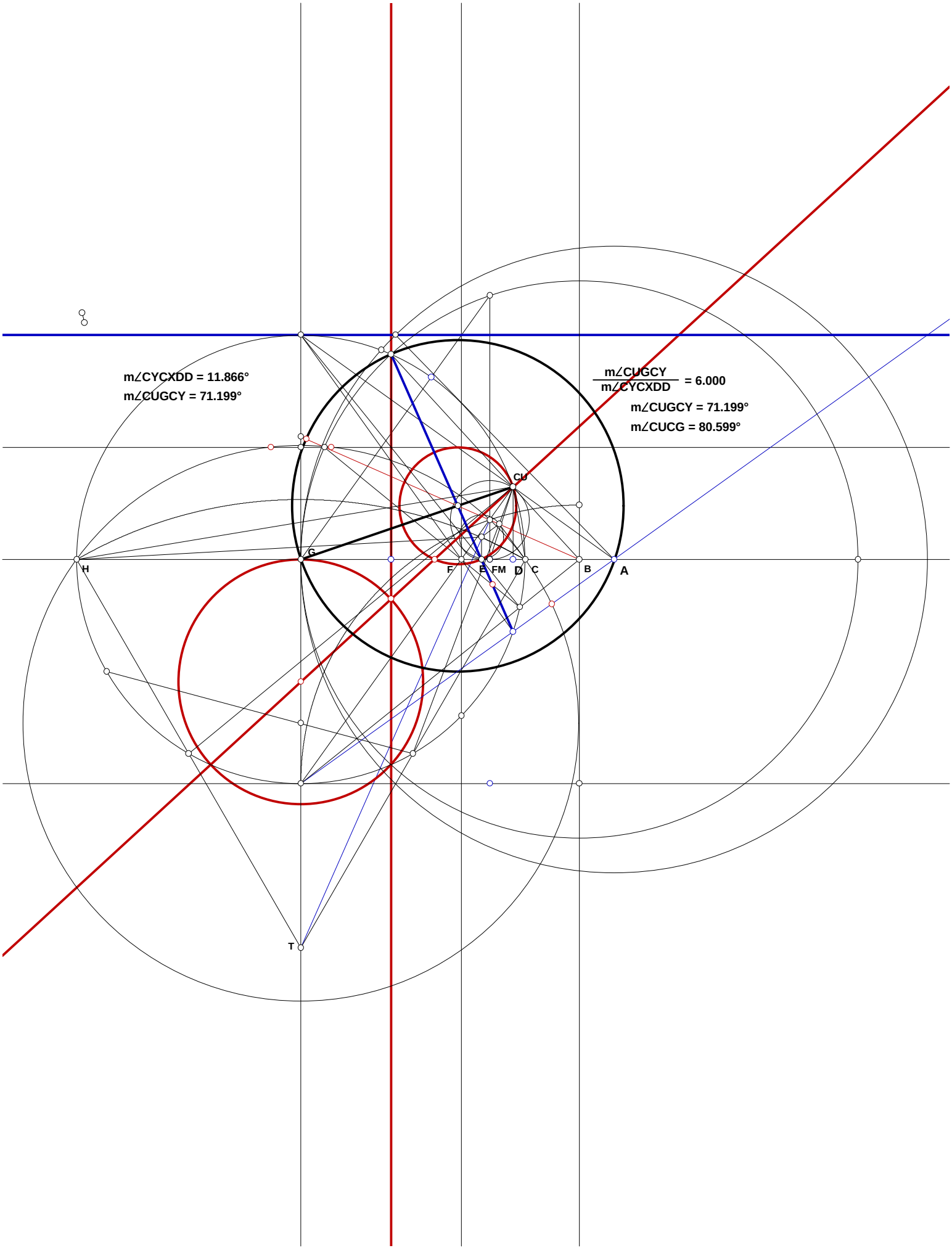

m∠RGP = 39.823°
m∠DAE = 19.911°
m∠RGP / m∠DAE = 2.000
P
S
D
R
G
E
A
5
4
3
2
1
-1
-2
-3
-4
-4
-3
-2
-1
1
2

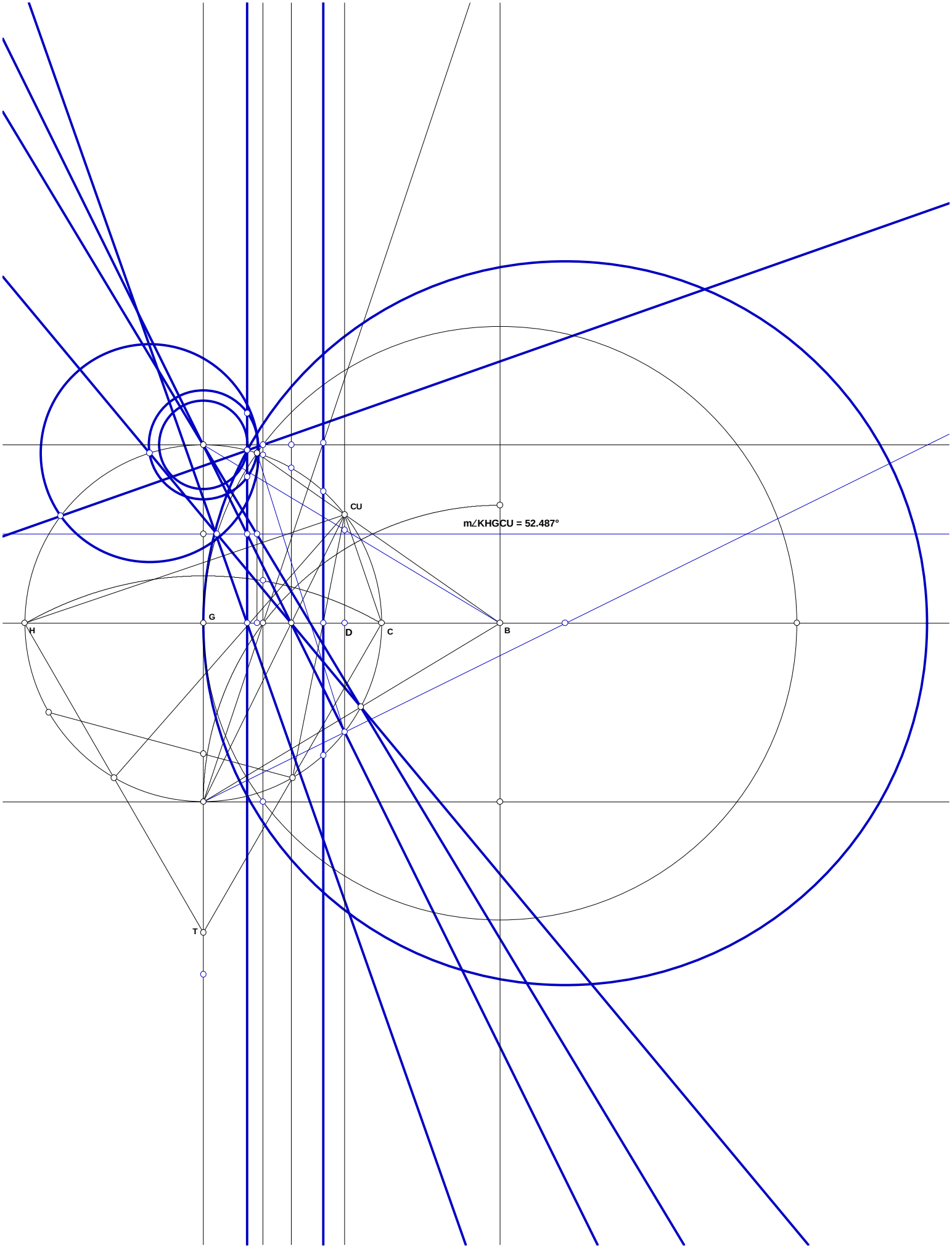

$\left(\frac{m\angle JMDG}{3} - m\angle OADG\right) 10000 = 0.176°$
$m\angle JZGKA = 30.000°$
$m\angle JMDG = 76.125°$
$m\angle OADG = 25.375°$
$\frac{m\angle JMDG}{3} - m\angle OADG = 0.000°$
G
T


m∠CYCXDD = 12.372°
m∠CUGCY = 74.233°
m∠CUGCY / m∠CYCXDD = 6.000
m∠CUGCY = 74.233°
m∠CUCG = 82.117°
m∠JJAIL = 77.458°
m∠CYGJJ = 47.700°
CU
G
H
F
E
FM
D
C
B
A
T

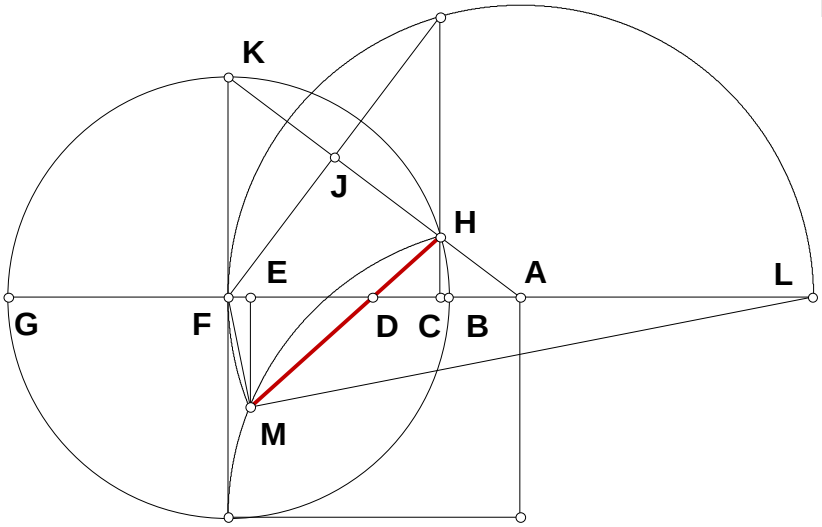

m∠CYCXDD = 8.086°
m∠CUGCY = 48.515°
m∠CUGCY / m∠CYCXDD = 6.000
m∠CUGCY = 48.515°
m∠CUCG = 69.258°
U
H
G
F
E
FM
D
C
B
A
T


m∠CYCXDD = 11.866°
m∠CUGCY = 71.199°
m∠CUGCY / m∠CYCXDD = 6.000
m∠CUGCY = 71.199°
m∠CUCG = 80.599°
CU
G
H
F
E
FM
D
C
B
A
T


m∠CYCXDD = 11.866°
m∠CUGCY = 71.199°
m∠CUGCY / m∠CYCXDD = 6.000
m∠CUGCY = 71.199°
m∠CUCG = 80.599°
CU
G
H
F
E
FM
D
C
B
A
T


CU
m∠KHGCU = 52.487°
G
H
D
C
B
T

Segment DF And HM 052201



Given AB and AG, what is HM and DF?

$N := 7.111$ $AB := .375$

$AG := AB \cdot N$ $BG := AG - AB$

$BF := \frac{BG}{2}$ $FK := BF$

$AF := AB + BF$

$AK := \sqrt{AF^2 + FK^2}$

$AJ := \frac{AF^2}{AK}$ $JK := AK - AJ$

$HJ := JK$ $AH := AK - (JK + HJ)$ $AC := \frac{AF \cdot AH}{AK}$ $EM := \frac{BF}{2}$ $FL := 2 \cdot AF$ $EF := \frac{FL}{2} - \frac{\sqrt{-4\ EM^2 + FL^2}}{2}$

$AE := AF - EF$ $CE := AE - AC$ $CH := \frac{FK \cdot AH}{AK}$ $HM := \sqrt{(EM + CH)^2 + CE^2}$ $DE := \frac{CE \cdot EM}{EM + CH}$

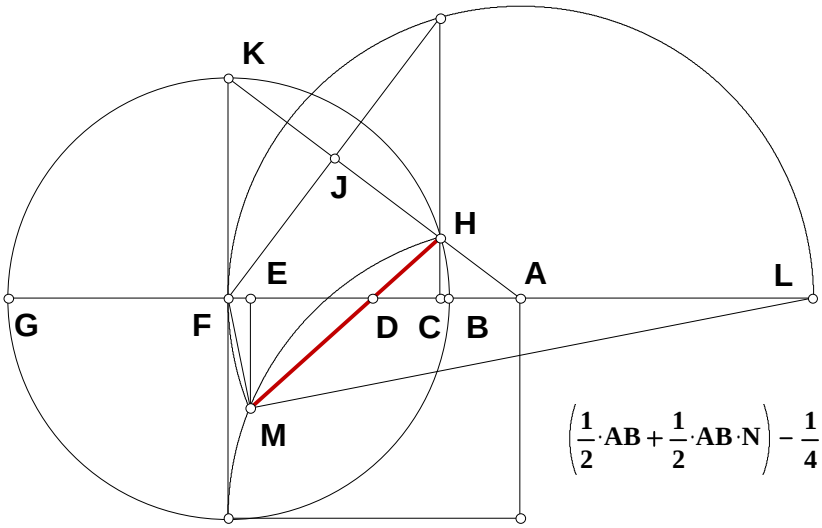
$DF := DE + EF$

Some Algebraic Names:

$AB \cdot N - AG = 0$ $AB \cdot N - AB - BG = 0$ $\frac{1}{2} \cdot AB \cdot N - \frac{1}{2} \cdot AB - BF = 0$ $\frac{1}{2} \cdot AB \cdot N - \frac{1}{2} \cdot AB - FK = 0$

$\frac{1}{2} \cdot AB + \frac{1}{2} \cdot AB \cdot N - AF = 0$ $\frac{1}{2} \cdot AB \cdot \sqrt{2} \cdot \sqrt{1 + N^2} - AK = 0$ $\frac{1}{4} \cdot AB \cdot (1 + N)^2 \cdot \frac{\sqrt{2}}{\sqrt{1 + N^2}} - AJ = 0$

$\frac{1}{4} \cdot \sqrt{2} \cdot AB \cdot \frac{(1 + N^2 - 2 \cdot N)}{\sqrt{1 + N^2}} - JK = 0$ $AB \cdot \sqrt{2} \cdot \frac{N}{\sqrt{1 + N^2}} - AH = 0$ $AB \cdot (1 + N) \cdot \frac{N}{1 + N^2} - AC = 0$



$$\frac{1}{4}\cdot AB\cdot N-\frac{1}{4}\cdot AB-EM=0$$

$$AB+AB\cdot N-FL=0$$

$$\left(\frac{1}{2}\cdot AB+\frac{1}{2}\cdot AB\cdot N\right)-\frac{1}{4}\cdot AB\cdot\sqrt{3\cdot N^2+10\cdot N+3}-EF=0$$

$$\frac{1}{4}\cdot AB\cdot\sqrt{3\cdot N^2+10\cdot N+3}-AE=0$$

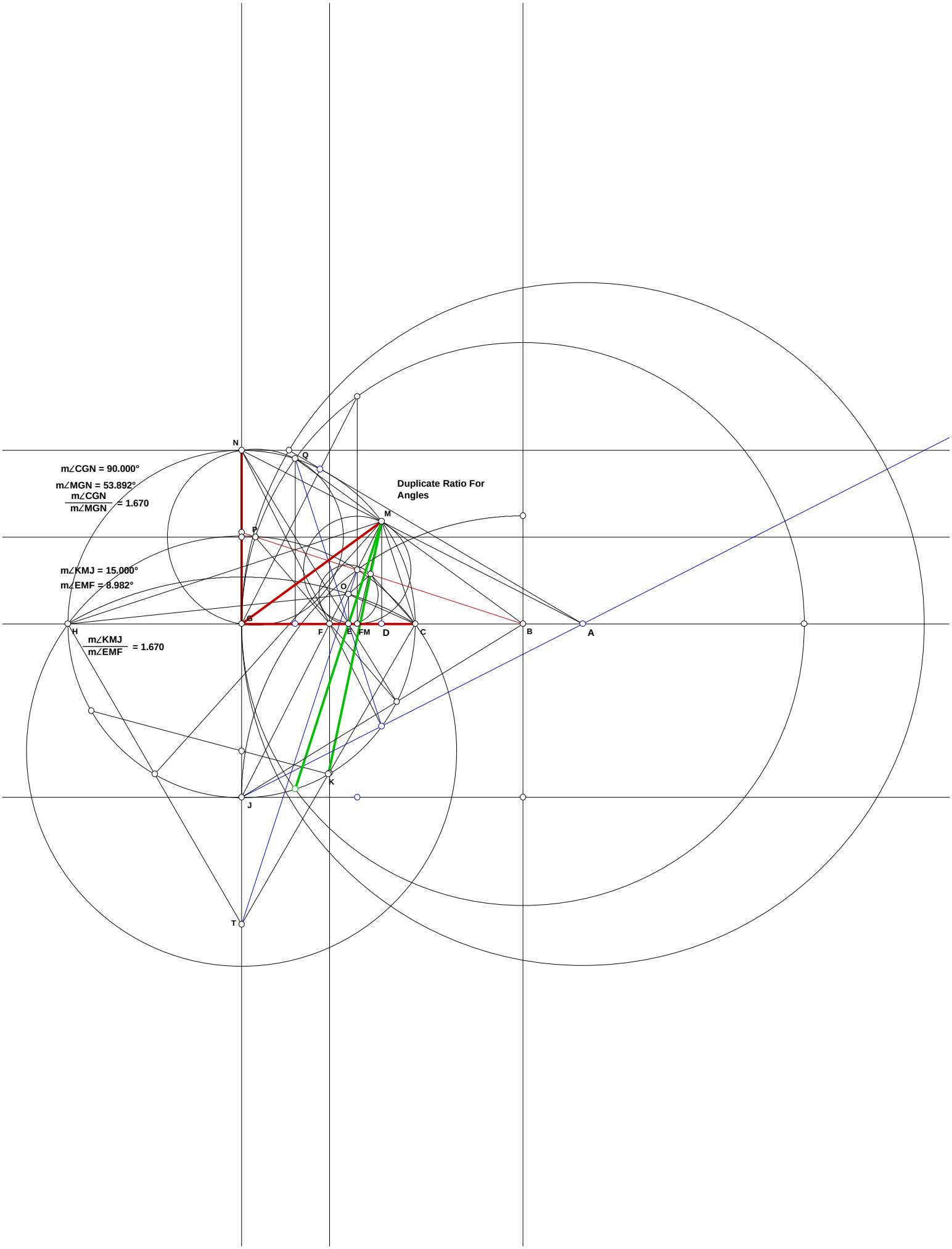
$$\frac{1}{4}\cdot AB\cdot\frac{\left(\sqrt{3\cdot N^2+10\cdot N+3}+\sqrt{3\cdot N^2+10\cdot N+3}\cdot N^2-4\cdot N-4\cdot N^2\right)}{\left(1+N^2\right)}-CE=0$$

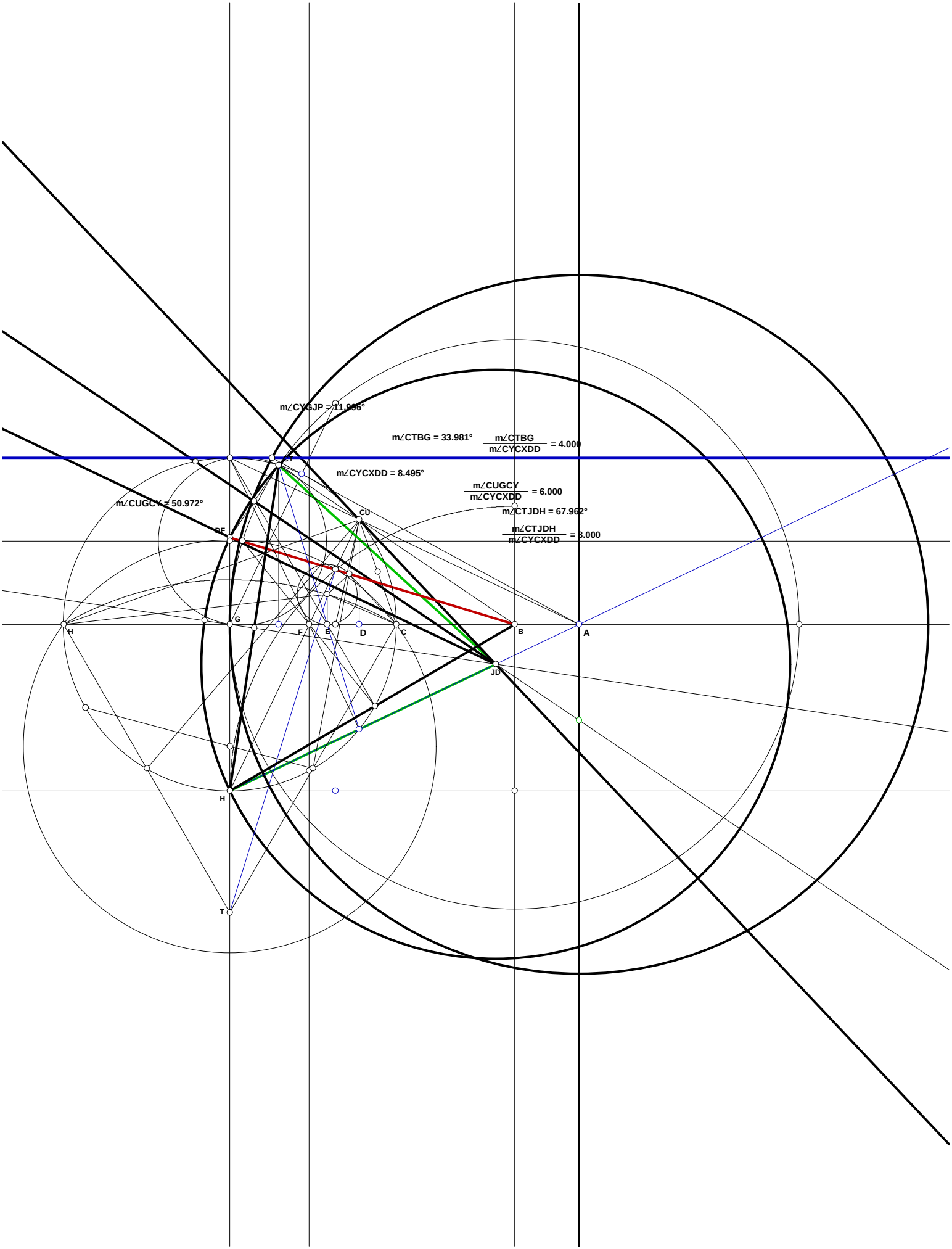
$$(N-1)\cdot AB\cdot\frac{N}{\left(1+N^2\right)}-CH=0$$

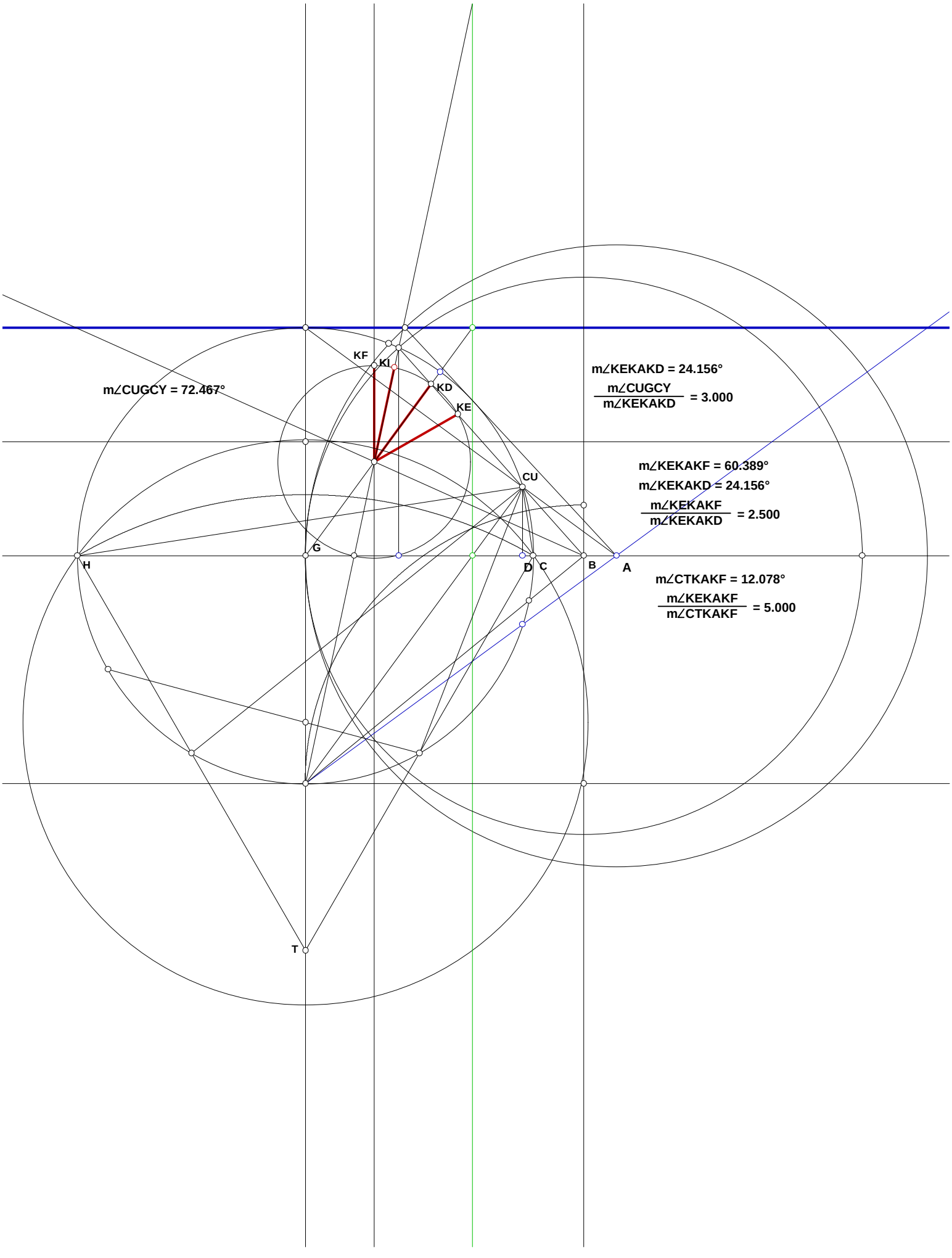
$$\frac{1}{2}\cdot AB\cdot\sqrt{(1+N)\cdot\frac{\left[N^3+3\cdot N^2-2\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}\cdot N+3\cdot N+1\right]}{\left(1+N^2\right)}}-HM=0$$

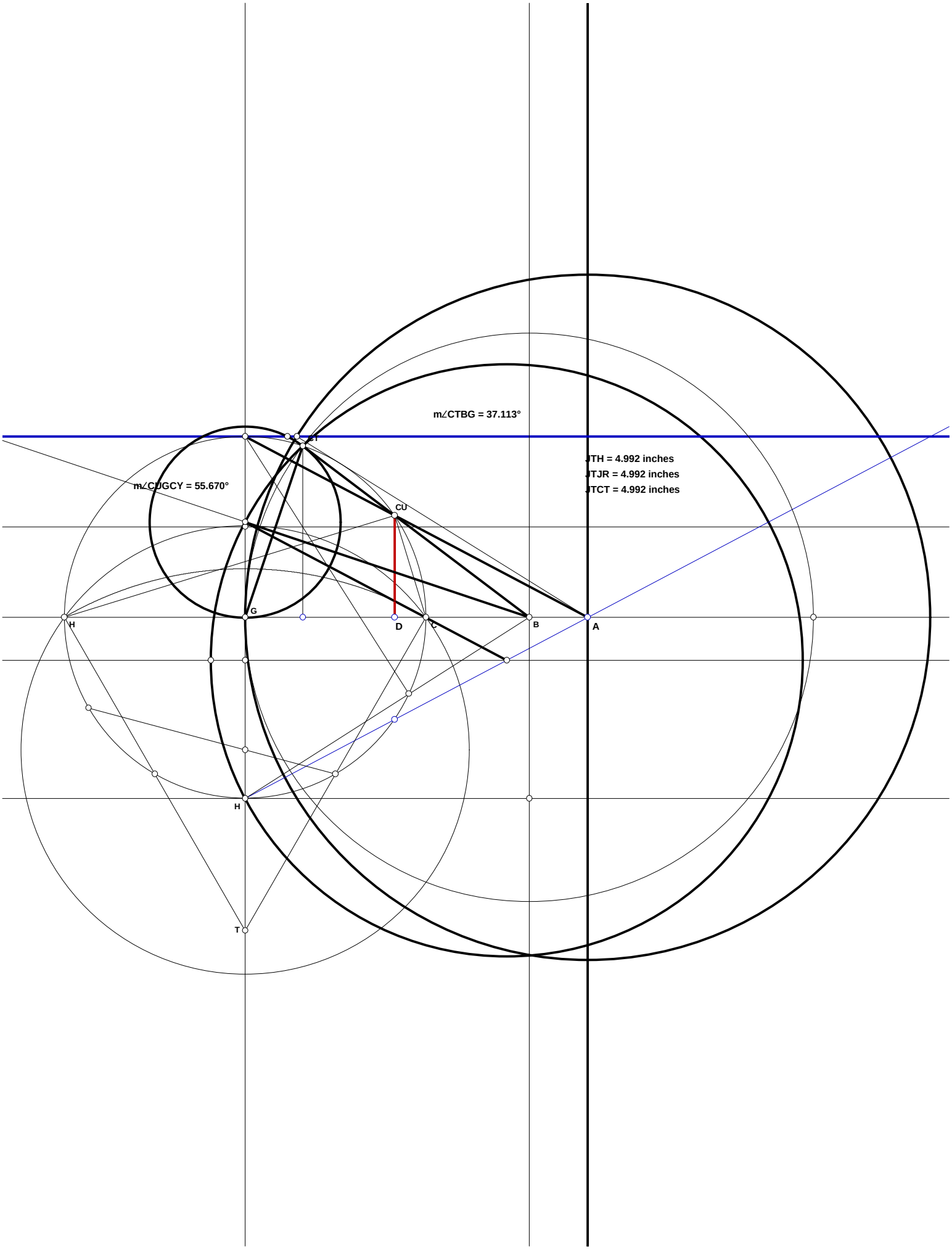
$$\frac{1}{4}\cdot\left(\sqrt{3\cdot N^2+10\cdot N+3}+\sqrt{3\cdot N^2+10\cdot N+3}\cdot N^2-4\cdot N-4\cdot N^2\right)\cdot\frac{AB}{\left(N^2+4\cdot N+1\right)}-DE=0$$

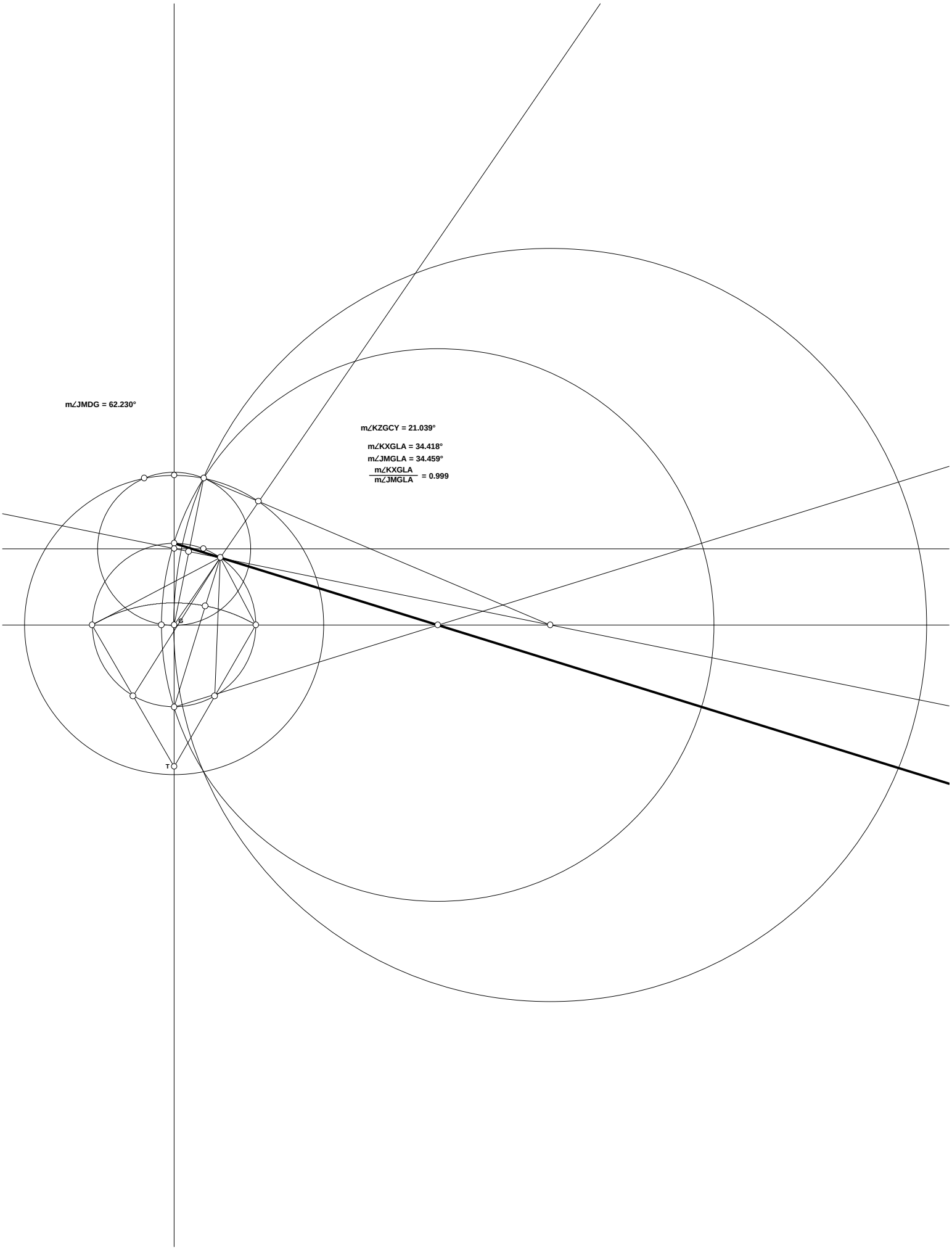
$$\frac{1}{2}\cdot AB\cdot\frac{\left(3\cdot N+3\cdot N^2+1+N^3-2\cdot\sqrt{3\cdot N^2+10\cdot N+3}\cdot N\right)}{\left(N^2+4\cdot N+1\right)}-DF=0$$

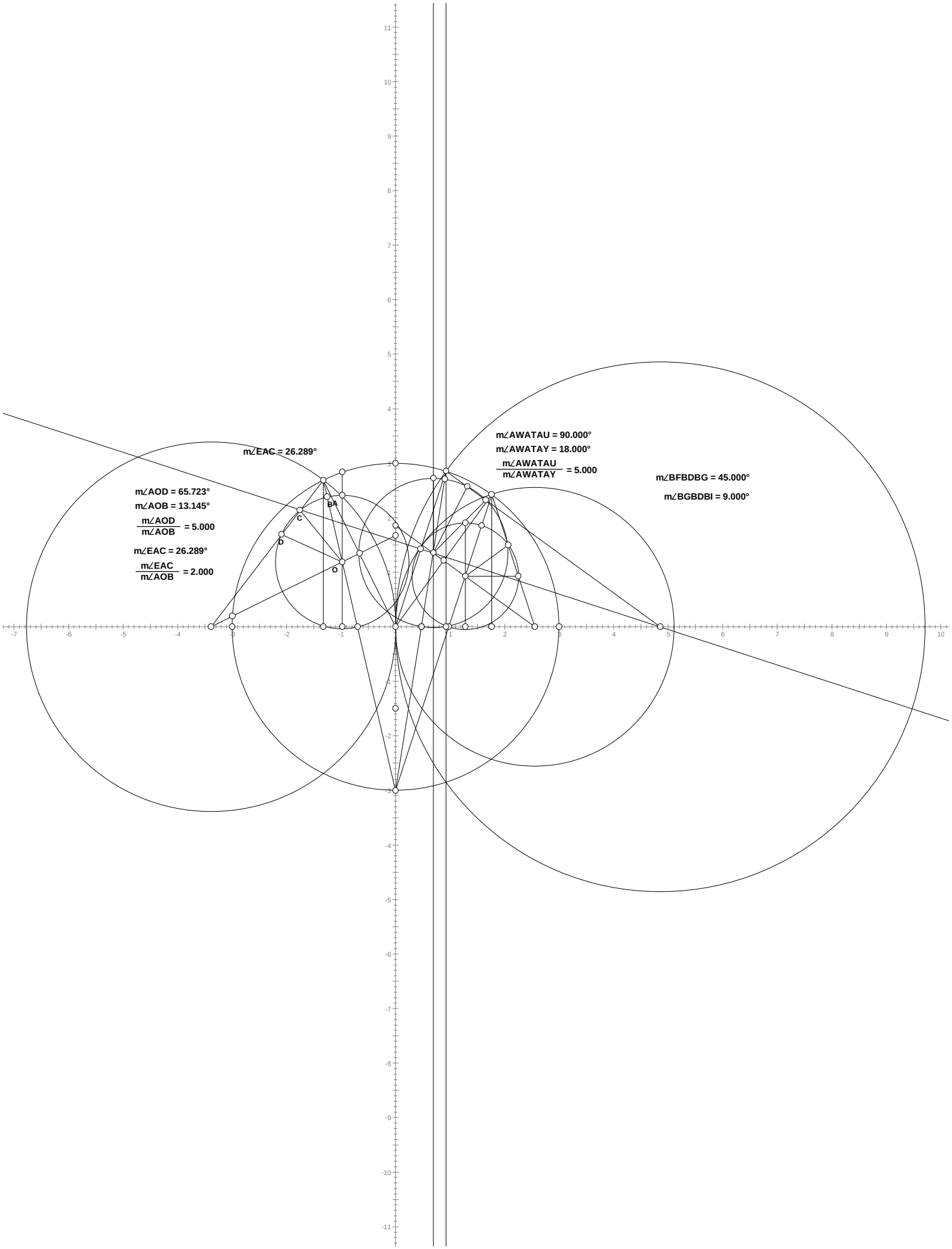

m∠CGN = 90.000°
m∠MGN = 53.892°
m∠CGN / m∠MGN = 1.670
Duplicate Ratio For Angles
m∠KMJ = 15.000°
m∠EMF = 8.982°
m∠KMJ / m∠EMF = 1.670
N
Q
M
P
O
H
G
F
E
FM
D
C
B
A
K
J
T

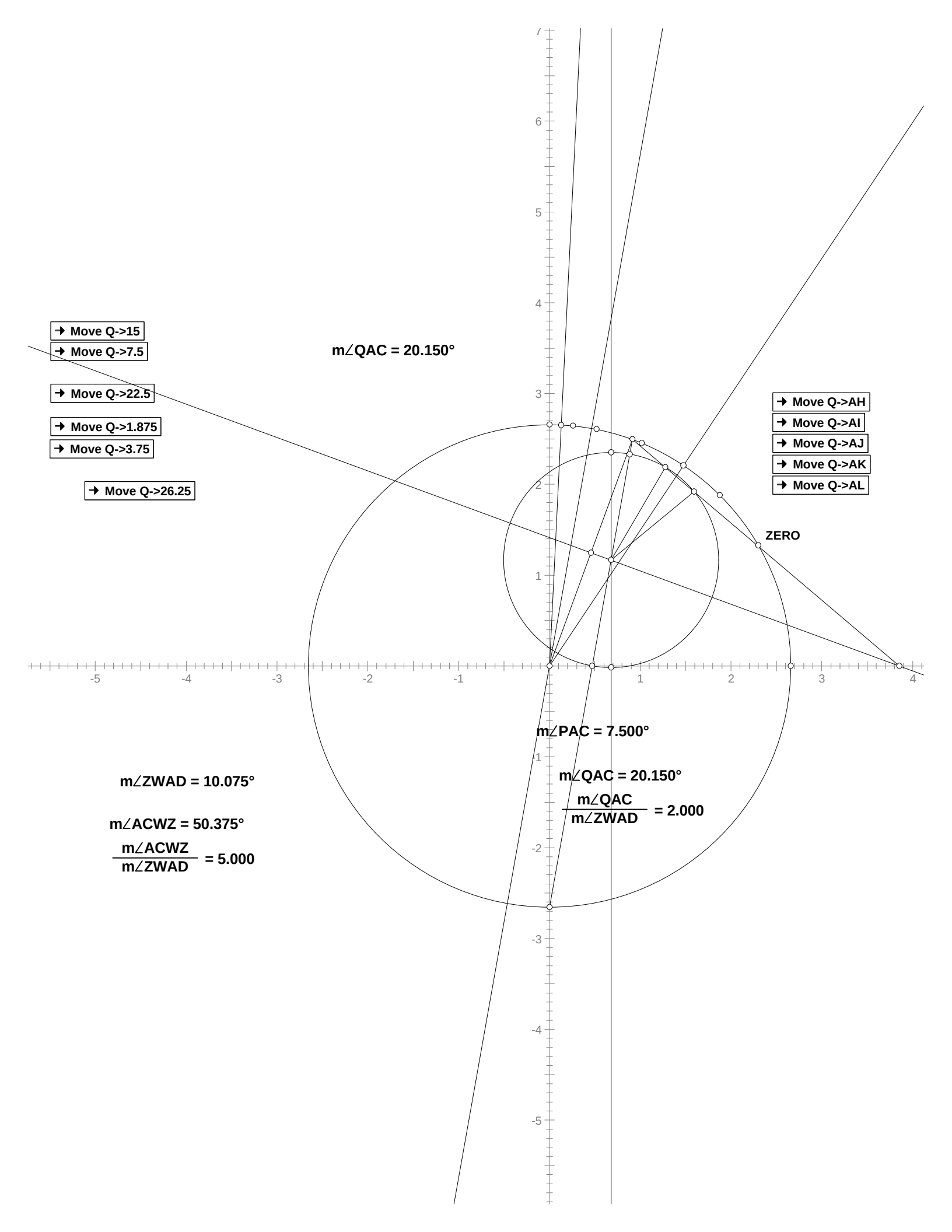

m∠CYGJP = 11.996°
m∠CTBG = 33.981°
m∠CTBG / m∠CYCXDD = 4.000
m∠CYCXDD = 8.495°
m∠CUGCY / m∠CYCXDD = 6.000
m∠CUGCY = 50.972°
m∠CTJDH = 67.962°
m∠CTJDH / m∠CYCXDD = 8.000
CT
CU
DE
G
H
F
E
D
C
B
A
JD
H
T

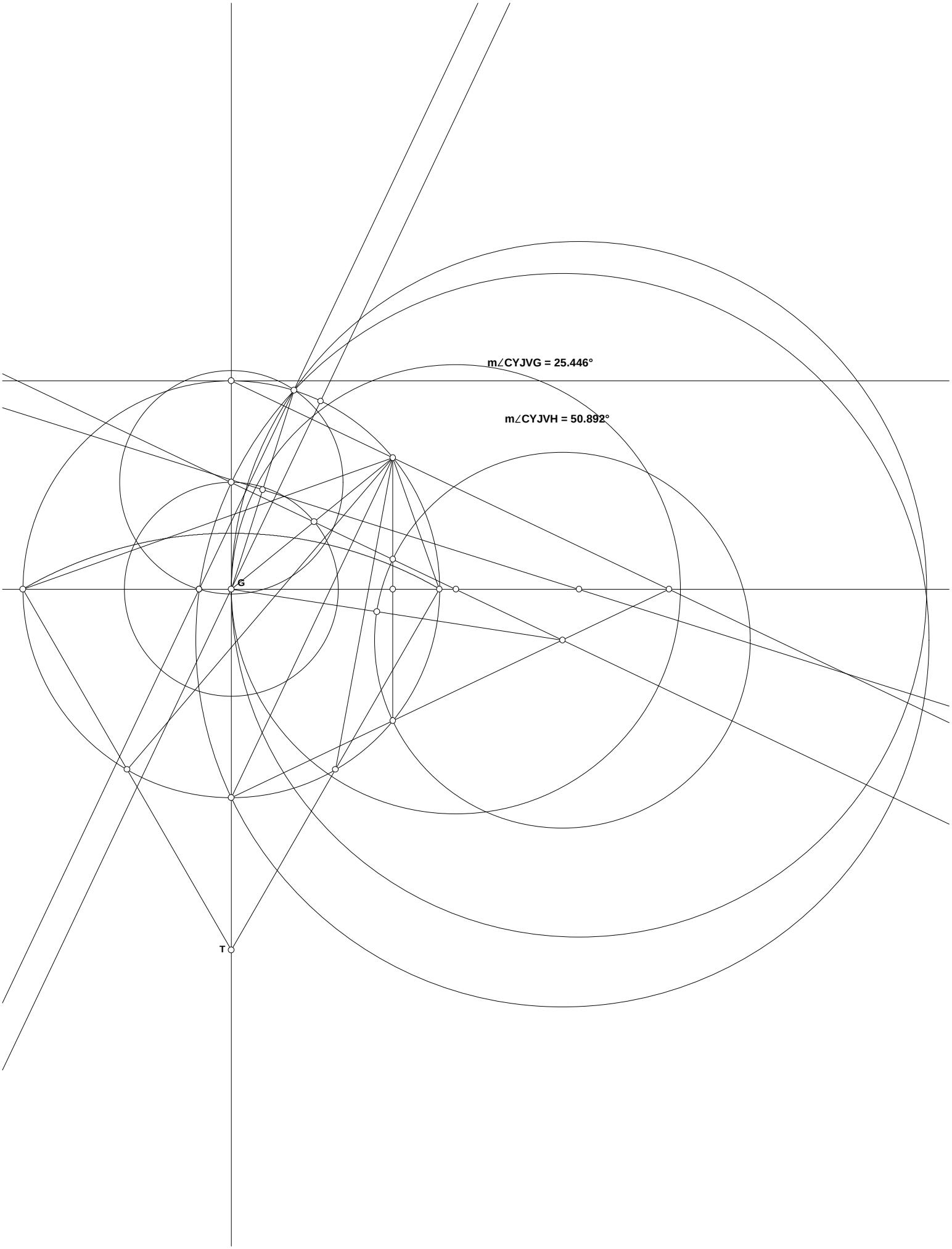

KF
KI
KD
KE
CU
G
H
D
C
B
A
T
m∠CUGCY = 72.467°
m∠KEKAKD = 24.156°
m∠CUGCY / m∠KEKAKD = 3.000
m∠KEKAKF = 60.389°
m∠KEKAKD = 24.156°
m∠KEKAKF / m∠KEKAKD = 2.500
m∠CTKAKF = 12.078°
m∠KEKAKF / m∠CTKAKF = 5.000

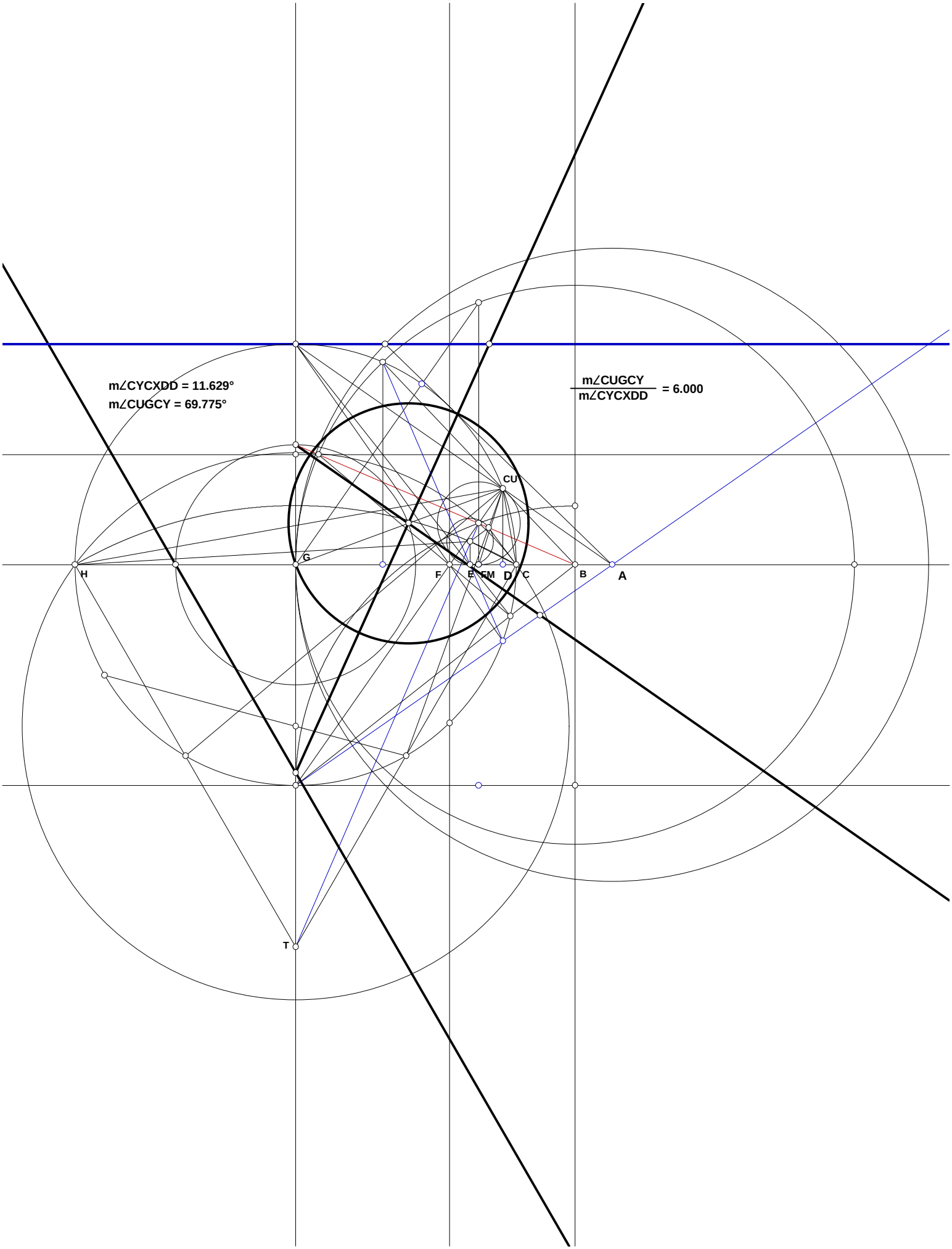

m∠CTBG = 37.113°
m∠CUGCY = 55.670°
JTH = 4.992 inches
JTJR = 4.992 inches
JTCT = 4.992 inches
CU
G
H
D
C
B
A
H
T

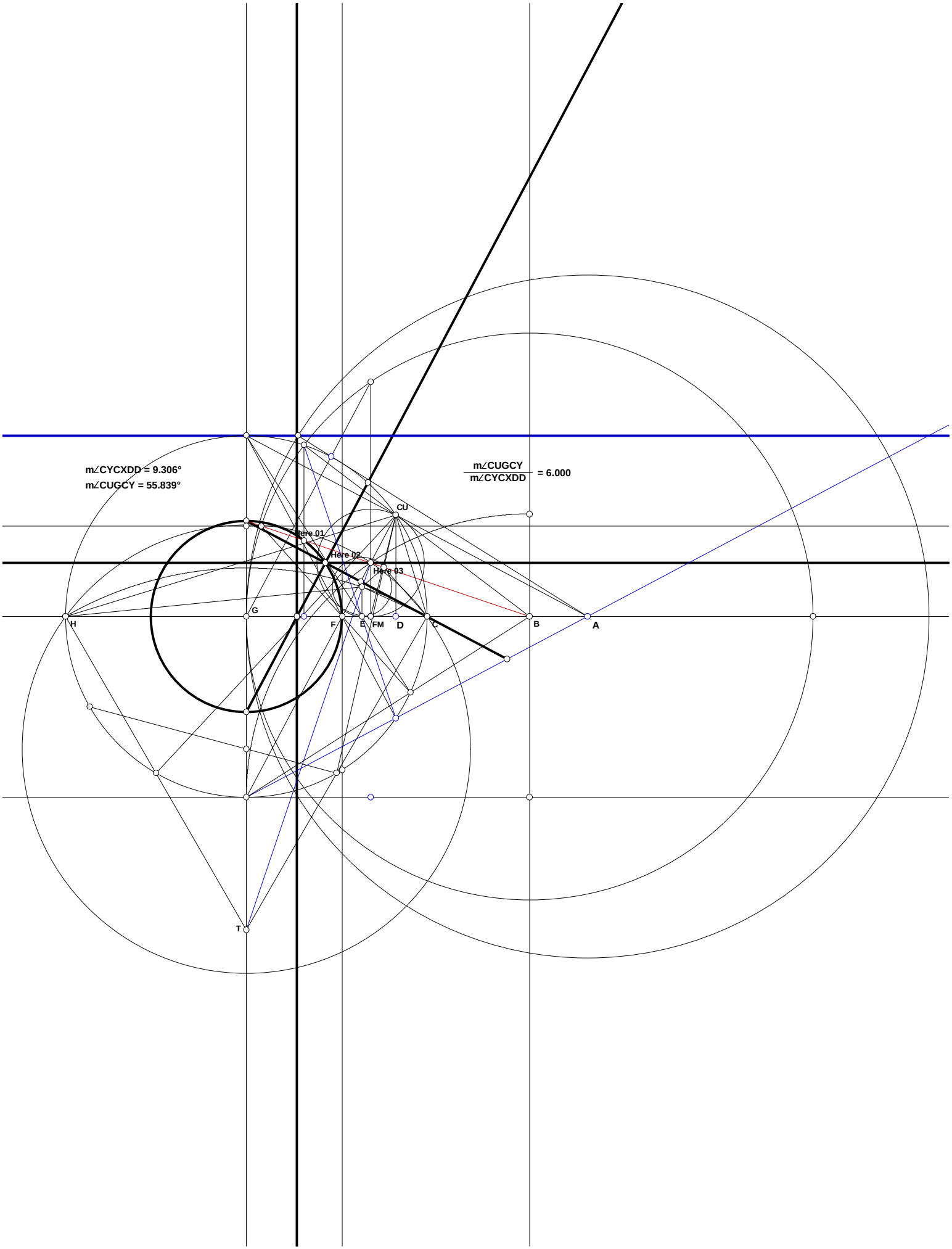

m∠JMDG = 62.230°
m∠KZGCY = 21.039°
m∠KXGLA = 34.418°
m∠JMGLA = 34.459°
m∠KXGLA / m∠JMGLA = 0.999
T


m∠EAC = 26.289°
m∠AOD = 65.723°
m∠AOB = 13.145°
m∠AOD / m∠AOB = 5.000
m∠EAC = 26.289°
m∠EAC / m∠AOB = 2.000
m∠AWATAU = 90.000°
m∠AWATAY = 18.000°
m∠AWATAU / m∠AWATAY = 5.000
m∠BFBDBG = 45.000°
m∠BGBDBI = 9.000°
A
B
C
D
O

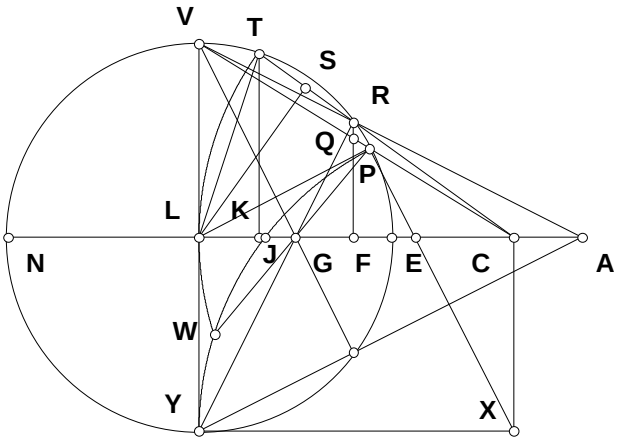

Move Q->15
Move Q->7.5
Move Q->22.5
Move Q->1.875
Move Q->3.75
Move Q->26.25
m∠QAC = 20.150°
Move Q->AH
Move Q->AI
Move Q->AJ
Move Q->AK
Move Q->AL
ZERO
m∠PAC = 7.500°
m∠QAC = 20.150°
m∠QAC / m∠ZWAD = 2.000
m∠ZWAD = 10.075°
m∠ACWZ = 50.375°
m∠ACWZ / m∠ZWAD = 5.000


m∠CYJVG = 25.446°
m∠CYJVH = 50.892°
G
T


m∠CYCXDD = 11.629°
m∠CUGCY = 69.775°
m∠CUGCY / m∠CYCXDD = 6.000
CU
G
H
F
E
FM
D
C
B
A
T


m∠CYCXDD = 9.306°
m∠CUGCY = 55.839°
m∠CUGCY / m∠CYCXDD = 6.000
CU
Here 01
Here 02
Here 03
G
H
F
E
FM
D
C
B
A
T

Point of Intersection 052701



Do RY and PW intersect at G?

$N := 5 \qquad CE := 1 \qquad CN := CE \cdot N$

$EN := CN - CE \qquad EL := \frac{EN}{2} \qquad LV := EL$

$LT := EL \qquad LY := EL \qquad CL := CE + EL \qquad CT := CL$

$S_1 := CL \qquad S_2 := CT \qquad S_3 := LT$

$KL := \frac{S_3^2 + S_1^2 - S_2^2}{2 \cdot S_1} \qquad CK := CL - KL \qquad CS := CK \qquad ST := CT - CS \qquad RS := ST$

$CR := CT - (ST + RS) \qquad CF := \frac{CK \cdot CR}{CT} \qquad FR := \sqrt{CR^2 - CF^2} \qquad FQ := \frac{LV \cdot CF}{CL} \qquad FL := CL - CF$

$GL := \frac{FL \cdot LY}{(LY + FR)}$

Some Algebraic Names:

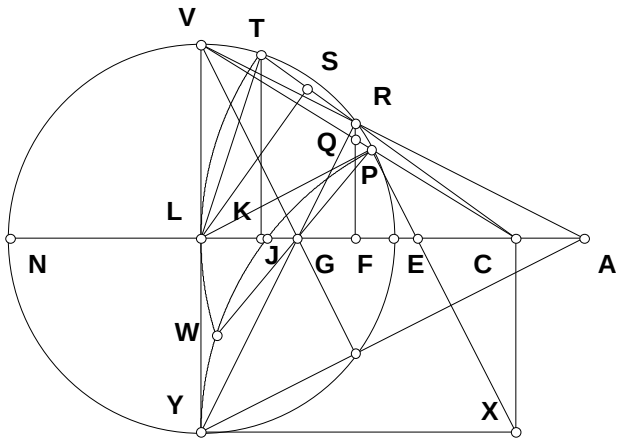
$CE \cdot N - CN = 0 \qquad CE \cdot N - CE - EN = 0 \qquad \frac{1}{2} \cdot CE \cdot N - \frac{1}{2} \cdot CE - EL = 0 \qquad \frac{1}{2} \cdot CE + \frac{1}{2} \cdot CE \cdot N - CL = 0$

$\frac{1}{4} \cdot CE \cdot \frac{(N-1)^2}{(1+N)} - KL = 0 \qquad \frac{1}{4} \cdot CE \cdot \frac{\left(1 + 6 \cdot N + N^2\right)}{(1+N)} - CK = 0 \qquad \frac{1}{4} \cdot CE \cdot \frac{\left(1 - 2 \cdot N + N^2\right)}{(1+N)} - ST = 0$

$2 \cdot CE \cdot \frac{N}{(1+N)} - CR = 0 \qquad CE \cdot \frac{\left(1 + 6 \cdot N + N^2\right)}{(1+N)^3} \cdot N - CF = 0$

$CE \cdot \sqrt{3 \cdot N^2 + 10 \cdot N + 3} \cdot N \cdot \frac{(N-1)}{(1+N)^3} - FR = 0 \qquad CE \cdot (N-1) \cdot \left(1 + 6 \cdot N + N^2\right) \cdot \frac{N}{(1+N)^4} - FQ = 0$

$\frac{1}{2} \cdot CE \cdot \frac{\left(1 + 2 \cdot N - 6 \cdot N^2 + 2 \cdot N^3 + N^4\right)}{(1+N)^3} - FL = 0$



$$GL := \frac{1}{2} \cdot \frac{CE \cdot \left(N^2 + 4 \cdot N + 1\right) \cdot (N-1)^2}{\left[N^3 + 3 \cdot N^2 + 2\ N \cdot \sqrt{(N+3) \cdot (3 \cdot N + 1)} + 3 \cdot N + 1\right]}$$

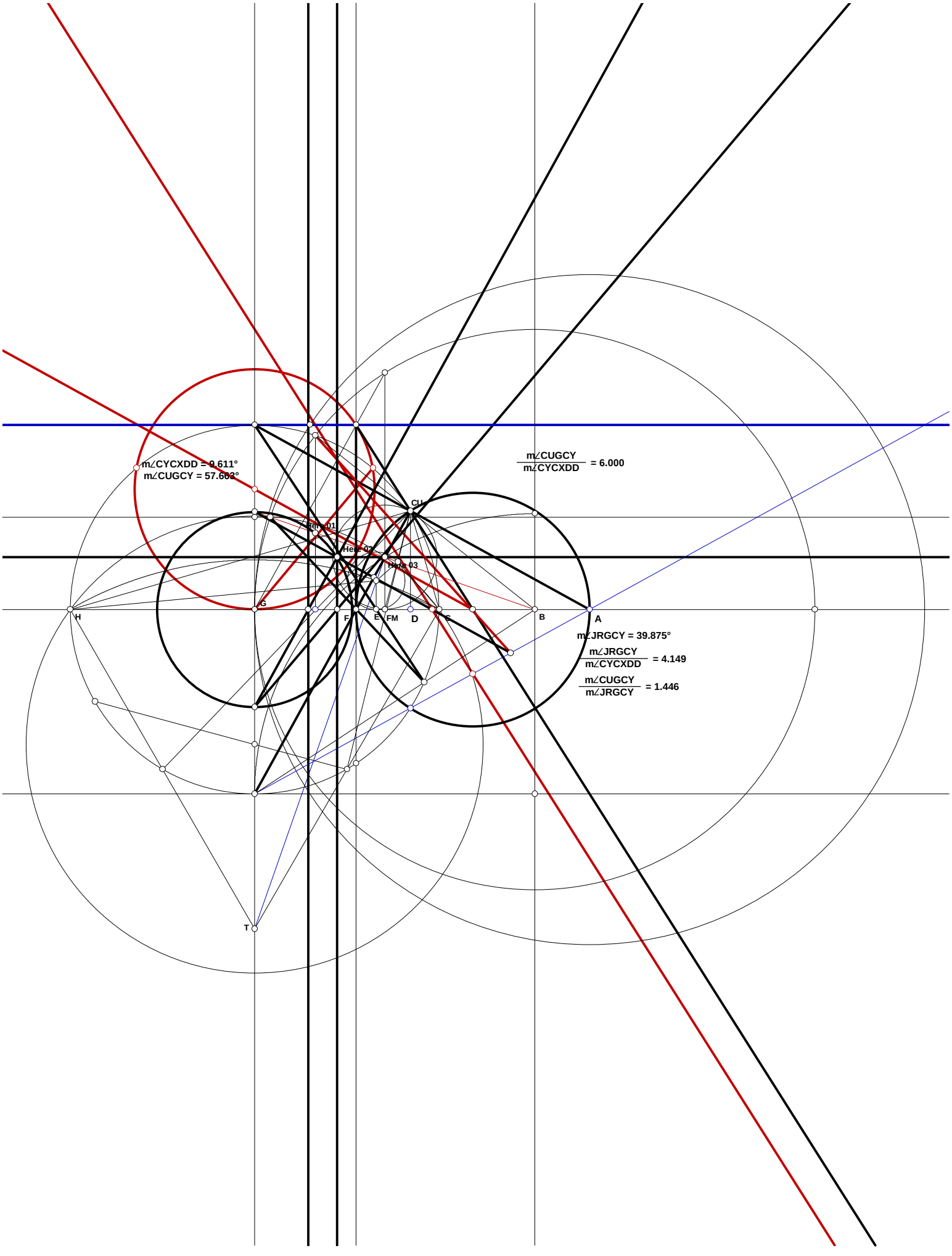
From Segment DF And HM 052201:

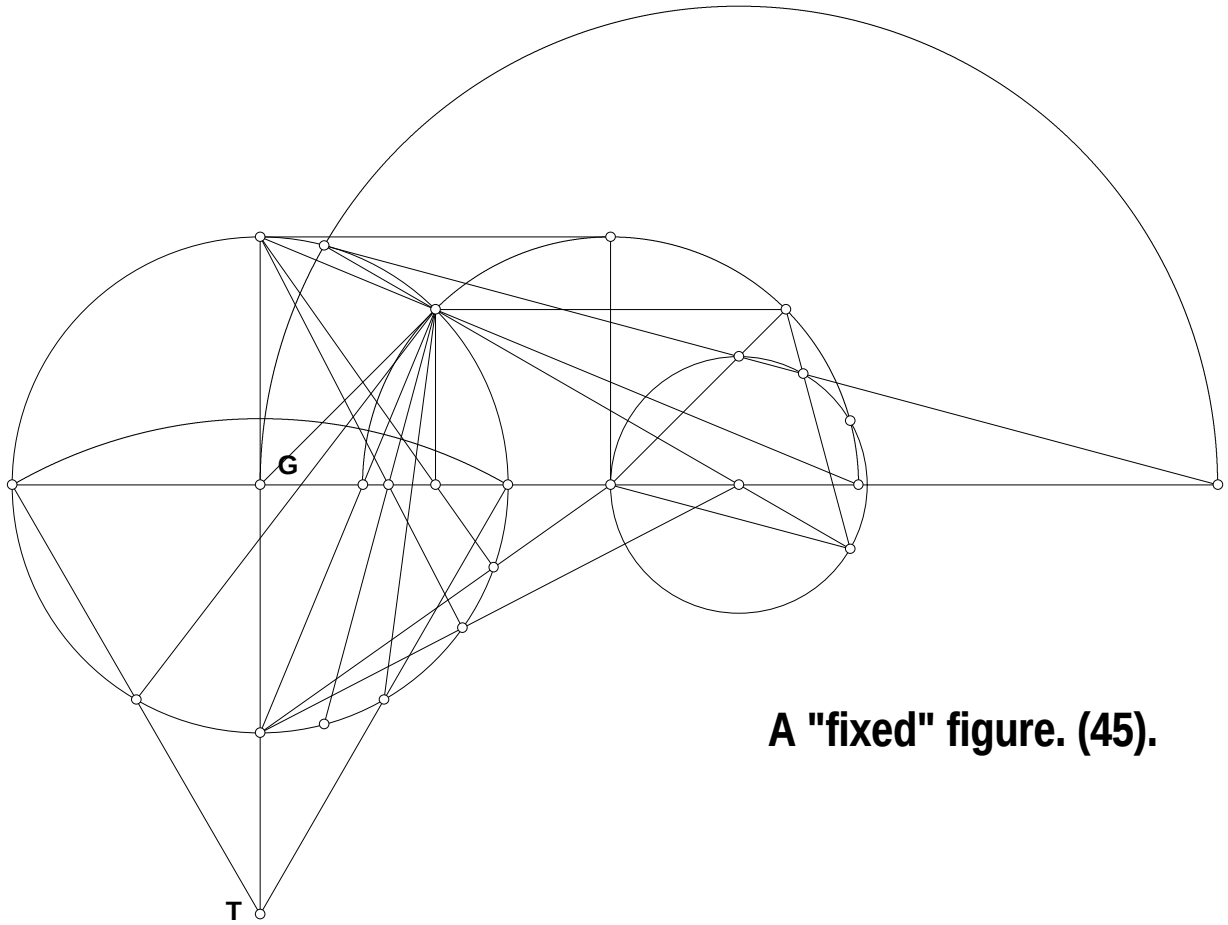
$$\frac{1}{2} \cdot \frac{CE \cdot \left(N^3 + 3 \cdot N^2 + 3 \cdot N - 2\ N \cdot \sqrt{3 \cdot N^2 + 10 \cdot N + 3} + 1\right)}{\left(N^2 + 4 \cdot N + 1\right)} - GL = 0$$

$$\frac{\frac{1}{2} \cdot \frac{CE \cdot \left(N^3 + 3 \cdot N^2 + 3 \cdot N - 2\ N \cdot \sqrt{3 \cdot N^2 + 10 \cdot N + 3} + 1\right)}{\left(N^2 + 4 \cdot N + 1\right)}}{\frac{1}{2} \cdot \frac{CE \cdot \left(N^2 + 4 \cdot N + 1\right) \cdot (N-1)^2}{\left[N^3 + 3 \cdot N^2 + 2\ N \cdot \sqrt{(N+3) \cdot (3 \cdot N + 1)} + 3 \cdot N + 1\right]}} = 1$$

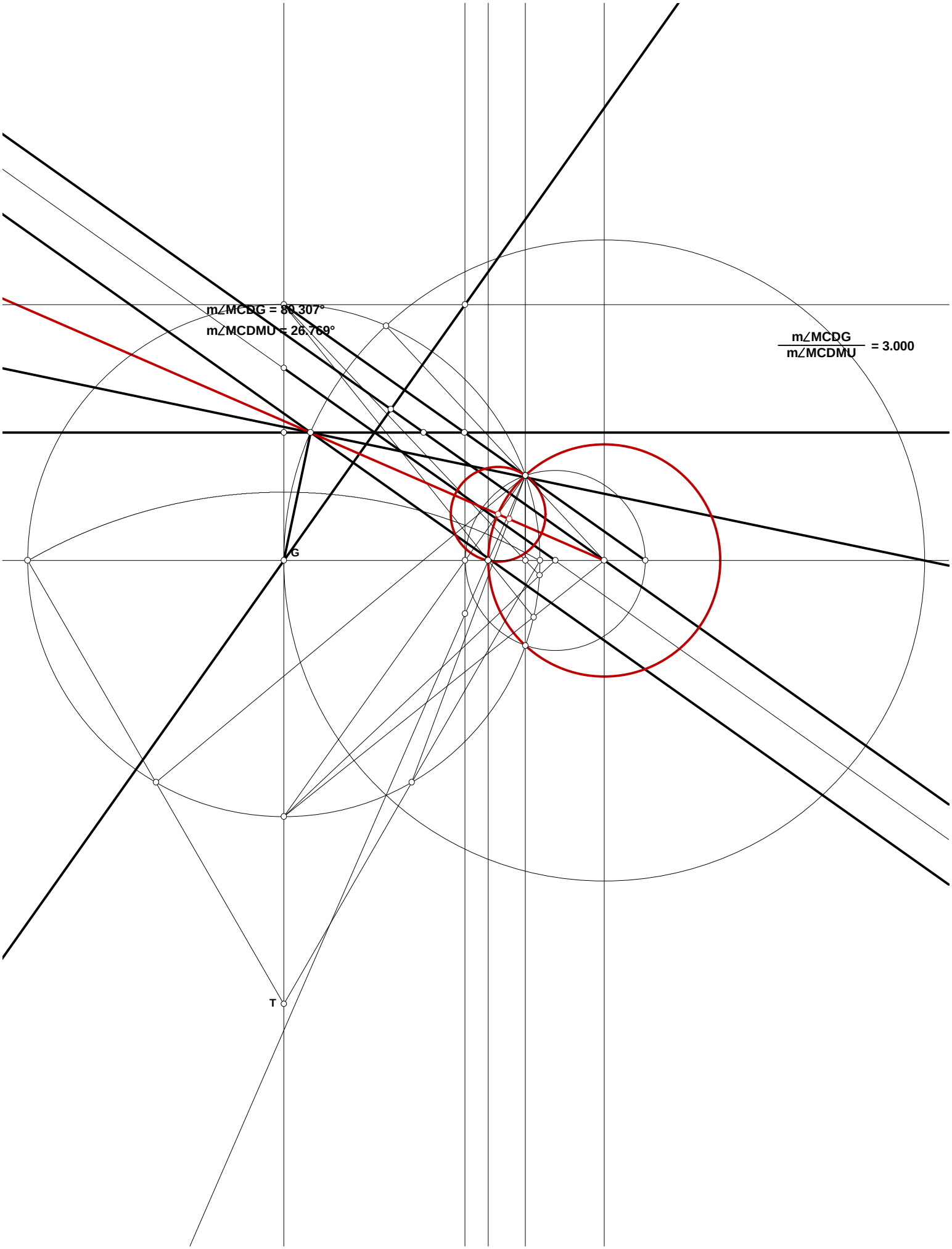
Which does reduce to,

$$1 = 1$$


m∠CYCXDD = 9.611°
m∠CUGCY = 57.668°
m∠CUGCY / m∠CYCXDD = 6.000
CU
Hero 01
Hero 02
Hero 03
G
H
F
E
FM
D
C
B
A
T
m∠JRGCY = 39.875°
m∠JRGCY / m∠CYCXDD = 4.149
m∠CUGCY / m∠JRGCY = 1.446

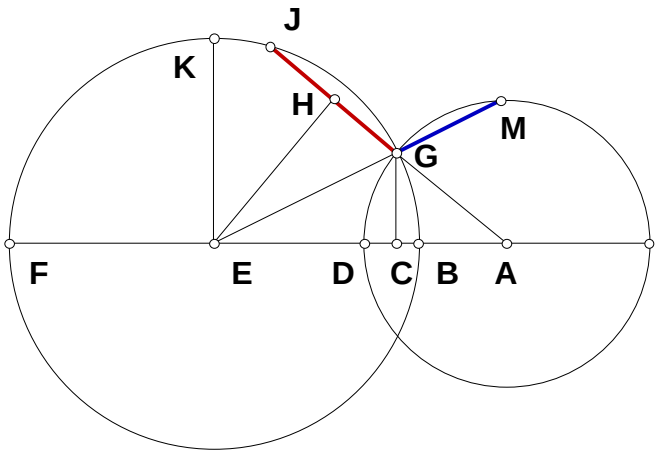


A "fixed" figure. (45).


m∠MCDG = 80.307°
m∠MCDMU = 26.769°
m∠MCDG / m∠MCDMU = 3.000
G
T

A Small Extrapolation 060101

Given AE, AG, and EG, what is the Algebraic name of the segment GJ?



$S_1 := 3 \quad S_2 := 2 \quad S_3 := 1$

$AE := S_1 \quad AG := S_2 \quad EG := S_3$

$$AC := \frac{AG^2 + AE^2 - EG^2}{2\,AE}$$

$$AH := \frac{AC \cdot AE}{AG} \quad GH := AH - AG$$

$HJ := GH \quad GJ := GH + HJ$

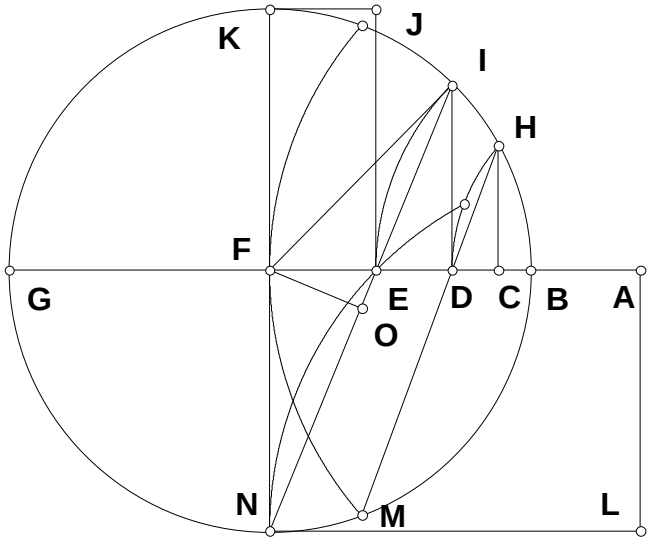
Some Algebraic Names:

$$\frac{S_2^2 + S_1^2 - S_3^2}{2\,S_1} - AC = 0 \qquad \frac{S_1^2 + S_2^2 - S_3^2}{2\,S_2} - AH = 0 \qquad \frac{S_1^2 - S_2^2 - S_3^2}{2\,S_2} - GH = 0$$

$$\frac{S_1^2 - S_2^2 - S_3^2}{S_2} - GJ = 0 \qquad \frac{S_1^2 - S_2^2 - S_3^2}{S_3} - GM = \;?$$

Units From Both Sides 060201

Start with AB as unit and find. . . . then start with . . . . as unit and find AB.



$N := 5.727 \qquad AB := .573 \qquad AG := AB \cdot N$

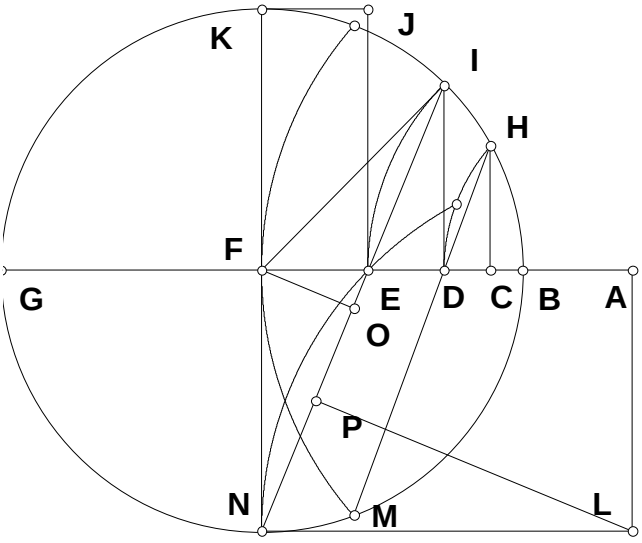
$BG := AG - AB \qquad BF := \frac{BG}{2} \qquad AF := AB + BF$

$AE := \sqrt{AB \cdot AG} \qquad BE := AE - AB$

$AB \cdot (N - 1) - BG = 0$

$\frac{1}{2} \cdot AB \cdot (N - 1) - BF = 0$

$\frac{1}{2} \cdot AB \cdot (1 + N) - AF = 0 \qquad AB\sqrt{N} - AE = 0 \qquad AB \cdot \left(\sqrt{N} - 1\right) - BE = 0$



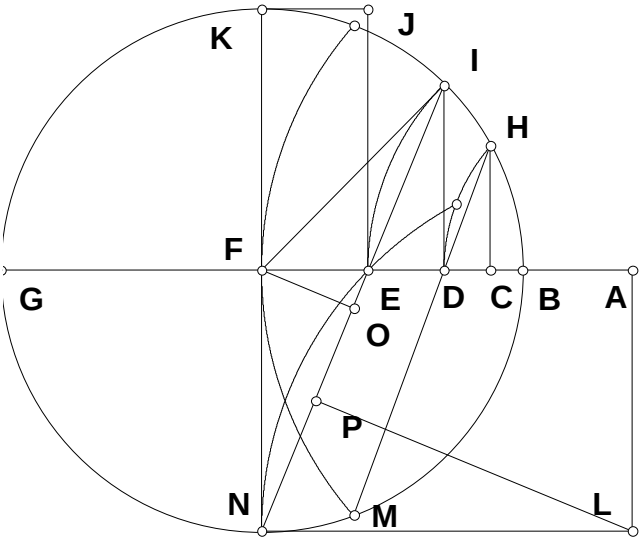
$N_2 := 2 \qquad BG_2 := 1 \qquad BF_2 := \frac{BG_2}{2}$

$BE_2 := \frac{BF_2}{N_2} \qquad EF_2 := BF_2 - BE_2$

$FN_2 := BF_2 \qquad EN_2 := \sqrt{EF_2^2 + FN_2^2}$

$NP_2 := \frac{EN_2}{2} \qquad LN_2 := \frac{EN_2 \cdot NP_2}{EF_2}$

$AF_2 := LN_2 \qquad AB_2 := AF_2 - BF_2$



$$\frac{BG_2}{2} - BF_2 = 0 \qquad \frac{BG_2}{(2 \cdot N_2)} - BE_2 = 0$$

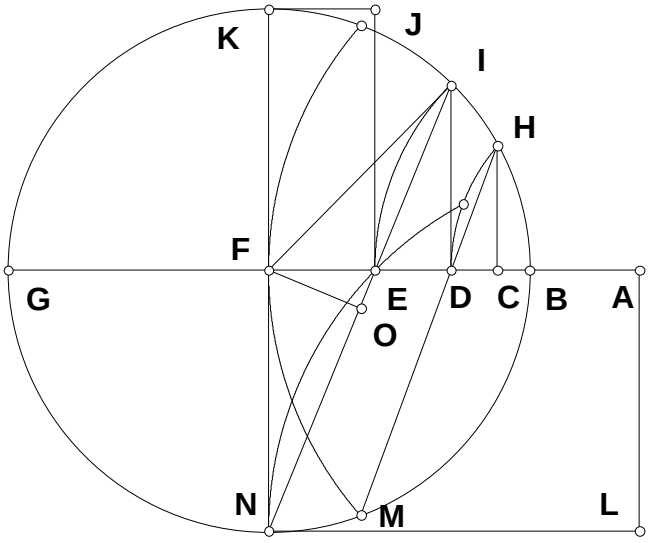
$$\frac{BG_2}{2} \cdot \frac{(N_2 - 1)}{N_2} - EF_2 = 0$$

$$\frac{BG_2}{2} \cdot \frac{\sqrt{2 \cdot N_2^2 - 2 \cdot N_2 + 1}}{N_2} - EN_2 = 0$$

$$\frac{BG_2}{4} \cdot \frac{\sqrt{2 \cdot N_2^2 - 2 \cdot N_2 + 1}}{N_2} - NP_2 = 0$$

$$\frac{BG_2}{4} \cdot \frac{(2 \cdot N_2^2 - 2 \cdot N_2 + 1)}{[N_2 \cdot (N_2 - 1)]} - LN_2 = 0$$

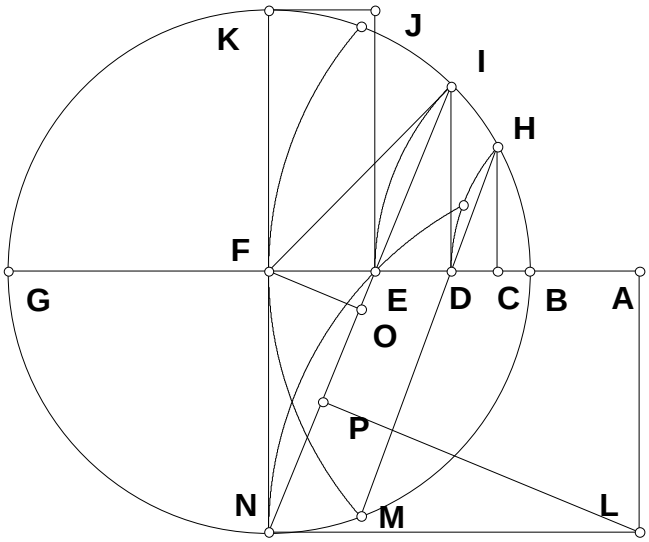
$$\frac{BG_2}{4 \cdot N_2 \cdot (N_2 - 1)} - AB_2 = 0$$



$$AI := AE \quad FI := BF \quad AD := \frac{AI^2 + AF^2 - FI^2}{2\,AF}$$

$$BD := AD - AB$$

$$AD := 2 \cdot AB \cdot \frac{N}{(N+1)} \qquad BD := AB \cdot \frac{(N-1)}{(1+N)}$$



$N_3 := 3.364 \quad BG_3 := 2.708 \quad BF_3 := \frac{BG_3}{2}$

$BD_3 := \frac{BF_3}{N_3} \quad DG_3 := BG_3 - BD_3$

$DI_3 := \sqrt{BD_3 \cdot DG_3} \quad DF_3 := BF_3 - BD_3$

$FN_3 := BF_3 \quad EF_3 := \frac{DF_3 \cdot FN_3}{FN_3 + DI_3}$

$EN_3 := \sqrt{EF_3^2 + FN_3^2} \quad NP_3 := \frac{EN_3}{2}$

$LN_3 := \frac{EN_3 \cdot NP_3}{EF_3} \quad AF_3 := LN_3$

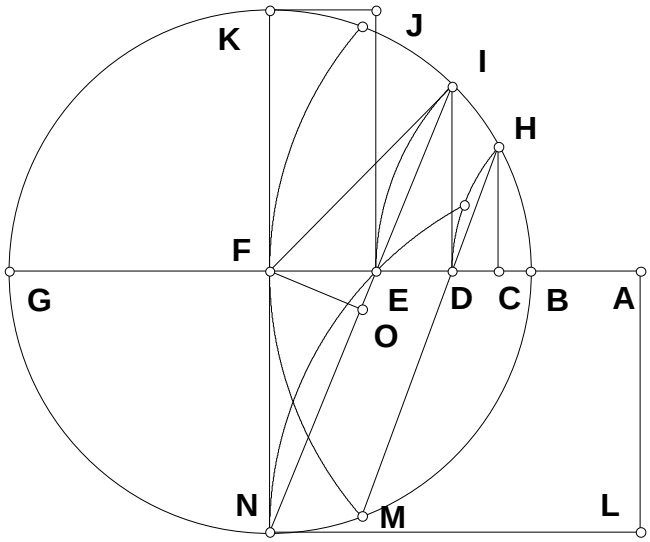
$AB_3 := AF_3 - BF_3 \quad AB_3 = 0.573$

$BD_3 := \frac{1}{2} \cdot \frac{BG_3}{N_3} \quad DG_3 := \frac{1}{2} \cdot BG_3 \cdot \frac{(2 \cdot N_3 - 1)}{N_3} \quad DI_3 := \frac{1}{(2 \cdot N_3)} \cdot BG_3 \cdot \sqrt{2 \cdot N_3 - 1}$

$DF_3 := \frac{1}{2} \cdot BG_3 \cdot \frac{(N_3 - 1)}{N_3} \quad EF_3 := \frac{1}{2} \cdot BG_3 \cdot \frac{(N_3 - 1)}{(N_3 + \sqrt{2 \cdot N_3 - 1})}$

$EN_3 := \frac{1}{2} \cdot BG_3 \cdot \sqrt{2} \cdot \sqrt{\frac{N_3}{(N_3 + \sqrt{2 \cdot N_3 - 1})}} \quad NP_3 := \frac{1}{4} \cdot BG_3 \cdot \sqrt{2} \cdot \sqrt{\frac{N_3}{(N_3 + \sqrt{2 \cdot N_3 - 1})}}$

$LN_3 := \frac{1}{2} \cdot BG_3 \cdot \frac{N_3}{(N_3 - 1)} \quad AB_3 := \frac{1}{2} \cdot \frac{BG_3}{(N_3 - 1)}$



$AH := AD$

$FH := BF \quad AC := \frac{AH^2 + AF^2 - FH^2}{2 \cdot AF}$

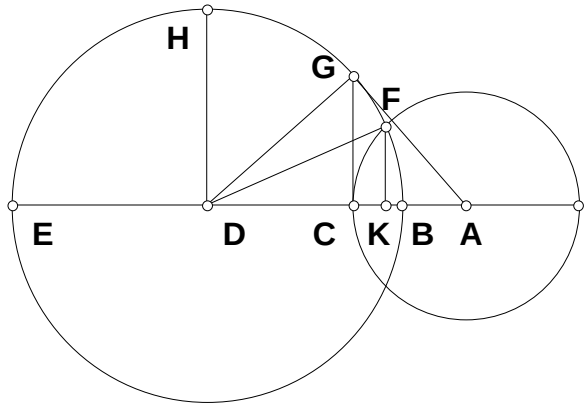
$BC := AC - AB$

$AB \cdot \left(\sqrt{N} - 1\right) - BE = 0$

$AC := AB \cdot N \cdot \frac{\left(6 \cdot N + 1 + N^2\right)}{(N+1)^3} \qquad BC := AB \cdot (3 \cdot N + 1) \cdot \frac{(N-1)}{(N+1)^3}$

Isolating A Problem 060301

If one is given point F, then finding point G would lead straightway to the solution. How is BK related to BC?



$N := 4 \qquad BE := 1$

$BD := \frac{BE}{2} \qquad BC := \frac{BE}{N} \qquad CE := BE - BC$

$CG := \sqrt{BC \cdot CE} \qquad CD := BD - BC \qquad AC := \frac{CG^2}{CD}$

$AF := AC \qquad AD := AC + CD \qquad DF := BD$

$DK := \frac{DF^2 + AD^2 - AF^2}{2\ AD} \qquad BK := BD - DK$

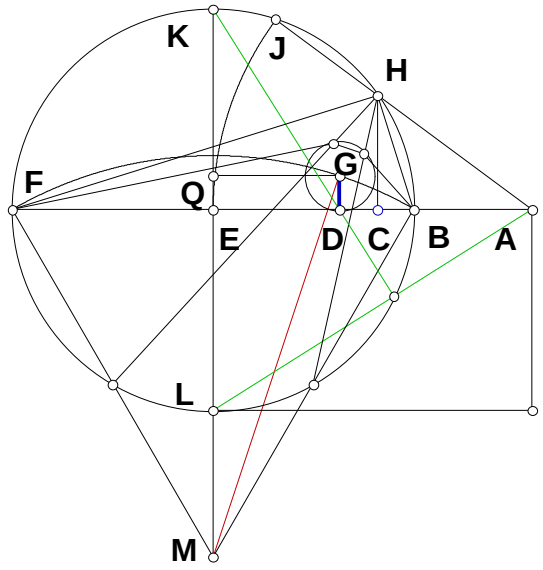
$CK := BC - BK$

$BE \cdot \frac{(N-1)}{N} - CE = 0 \qquad BE \cdot \frac{\sqrt{(N-1)}}{N} - CG = 0 \qquad BE \cdot \frac{(N-2)}{2 \cdot N} - CD = 0$

$BE \cdot \frac{2 \cdot (N-1)}{N \cdot (N-2)} - AC = 0 \qquad BE \cdot \frac{N}{2 \cdot (N-2)} - AD = 0 \qquad BE \cdot \frac{(N-2) \cdot \left(N^2 + 2 \cdot N - 2\right)}{2 \cdot N^3} - DK = 0$

$BE \cdot \frac{(3 \cdot N - 2)}{N^3} - BK = 0 \qquad BE \cdot \frac{(N-1) \cdot (N-2)}{N^3} - CK = 0 \qquad \frac{BK}{BC} - \frac{(3 \cdot N - 2)}{N^2} = 0$

For Any AB 061001



For any AB, AF what is DG?

$N := 4.39 \quad AB := .615 \quad AF := AB \cdot N$

$BF := AF - AB \quad BE := \frac{BF}{2} \quad EK := BE$

$AE := AB + BE \quad DE := \frac{EK^2}{AE} \quad EF := BE$

$FM := BF \quad EM := \sqrt{FM^2 - EF^2} \quad GM := FM$

$GQ := DE \quad MQ := \sqrt{GM^2 - GQ^2} \quad EQ := MQ - EM$

$DG := EQ$

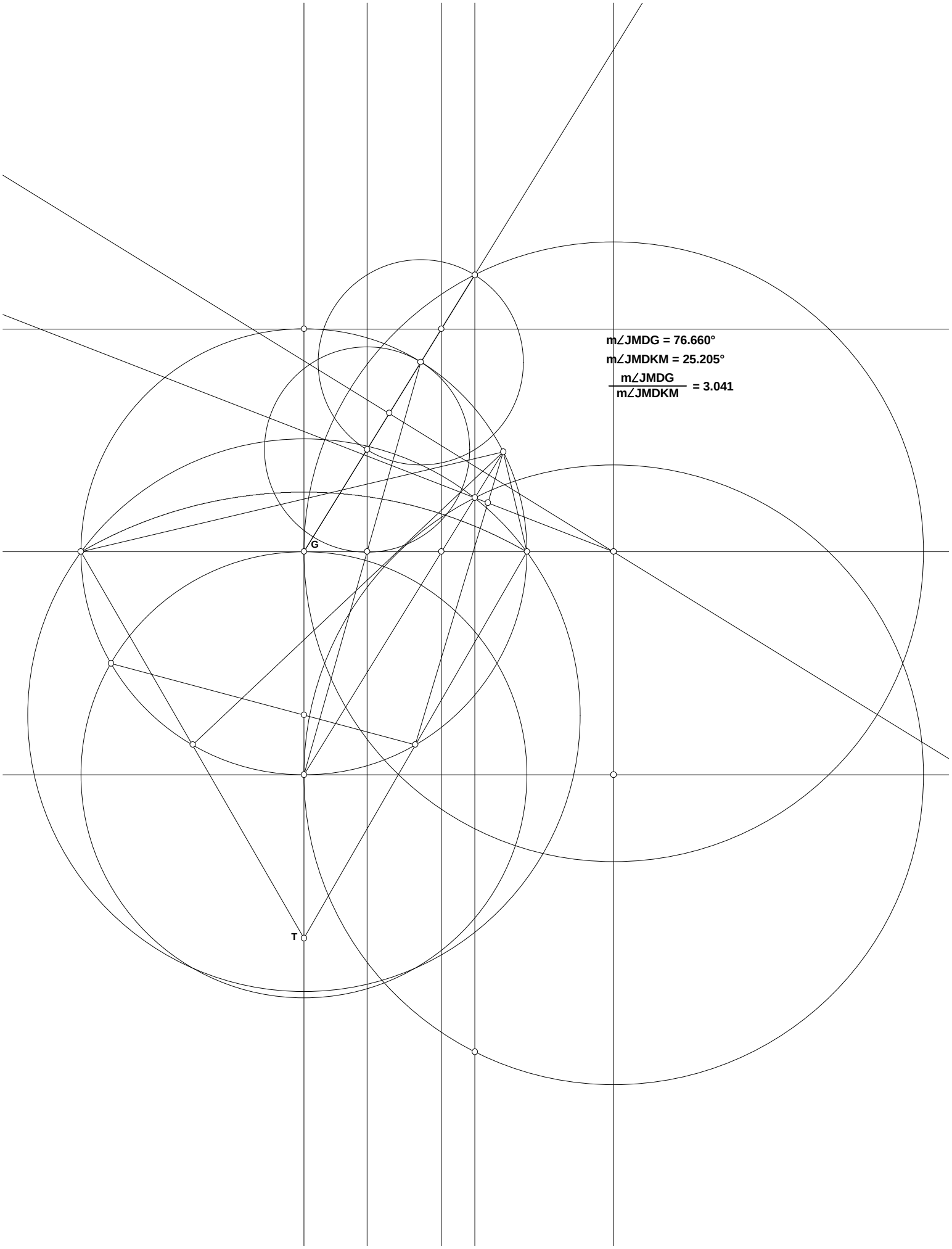
Some Algebraic Names:

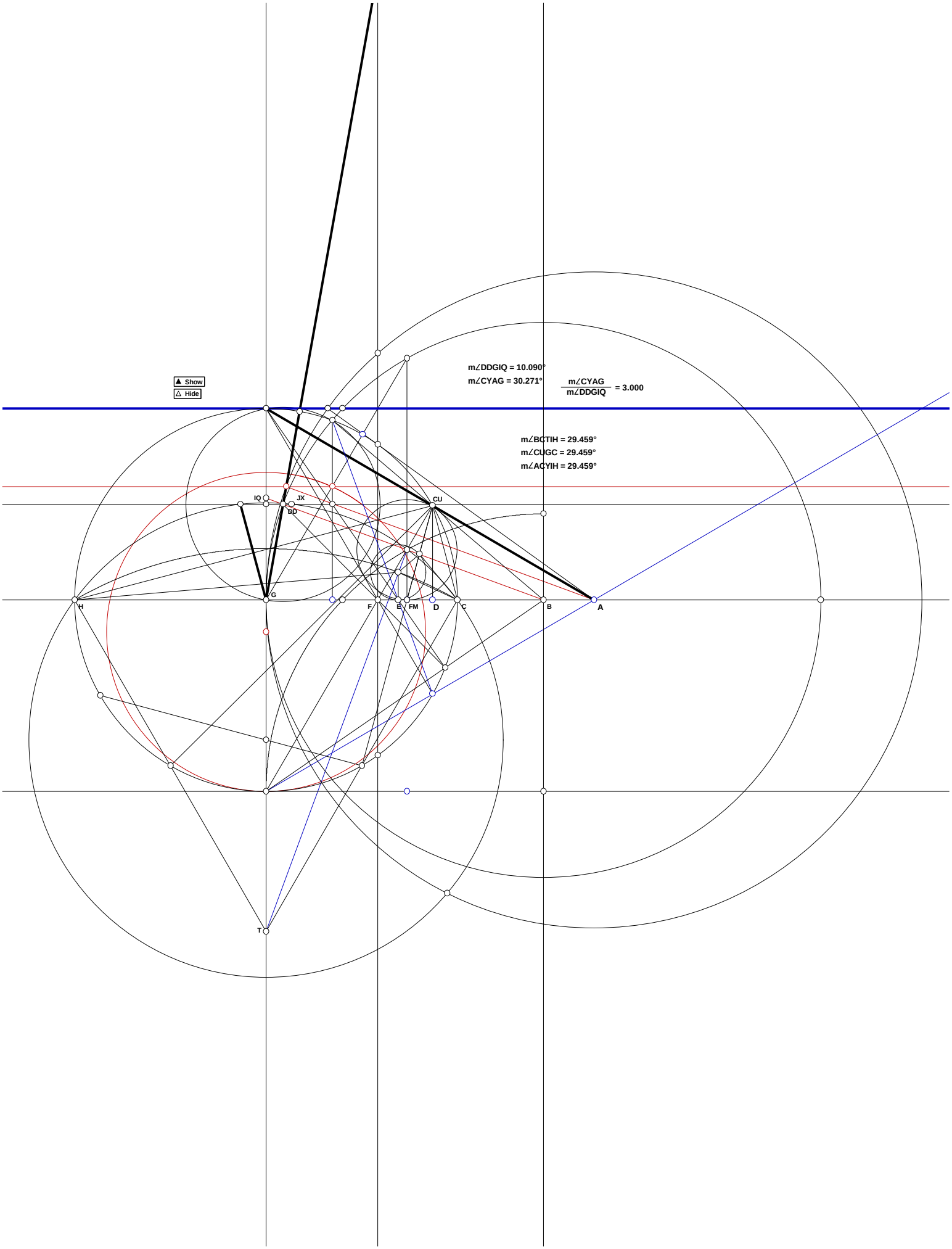
$AB \cdot (N - 1) - BF = 0 \qquad \frac{AB \cdot (N - 1)}{2} - BE = 0 \qquad \frac{1}{2} \cdot AB \cdot (N + 1) - AE = 0$

$\frac{1}{2} \cdot AB \cdot \frac{(N - 1)^2}{(N + 1)} - DE = 0 \qquad \frac{1}{2} \cdot \sqrt{3} \cdot AB \cdot (N - 1) - EM = 0$

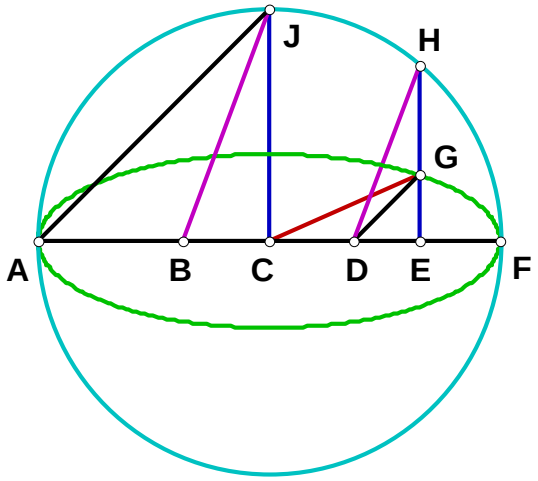
$$\frac{AB \cdot \left[\sqrt{(N + 3) \cdot (3 \cdot N + 1)} \cdot (N - 1)\right]}{2 \cdot (N + 1)} - MQ = 0$$

$$\frac{AB \cdot (N - 1) \cdot \left[\sqrt{(N + 3) \cdot (3 \cdot N + 1)} - \sqrt{3} - \sqrt{3} \cdot N\right]}{2 \cdot (N + 1)} - DG = 0$$


m∠JMDG = 76.660°
m∠JMDKM = 25.205°
m∠JMDG / m∠JMDKM = 3.041
G
T


Show
Hide
m∠DDGIQ = 10.090°
m∠CYAG = 30.271°
m∠CYAG / m∠DDGIQ = 3.000
m∠BCTIH = 29.459°
m∠CUGC = 29.459°
m∠ACYIH = 29.459°
IQ
JX
DD
CU
G
H
F
E
FM
D
C
B
A
T

Elipse By Parallels 082601



$N_1 := 4 \quad N_2 := 1$

$AF := 1 \quad AC := \frac{AF}{2} \quad CJ := AC$

$BC := \frac{AC}{N_1} \qquad AE := \frac{AF}{N_2}$

$EF := AF - AE \quad EH := \sqrt{AE \cdot EF} \quad EG := \frac{BC \cdot EH}{CJ}$

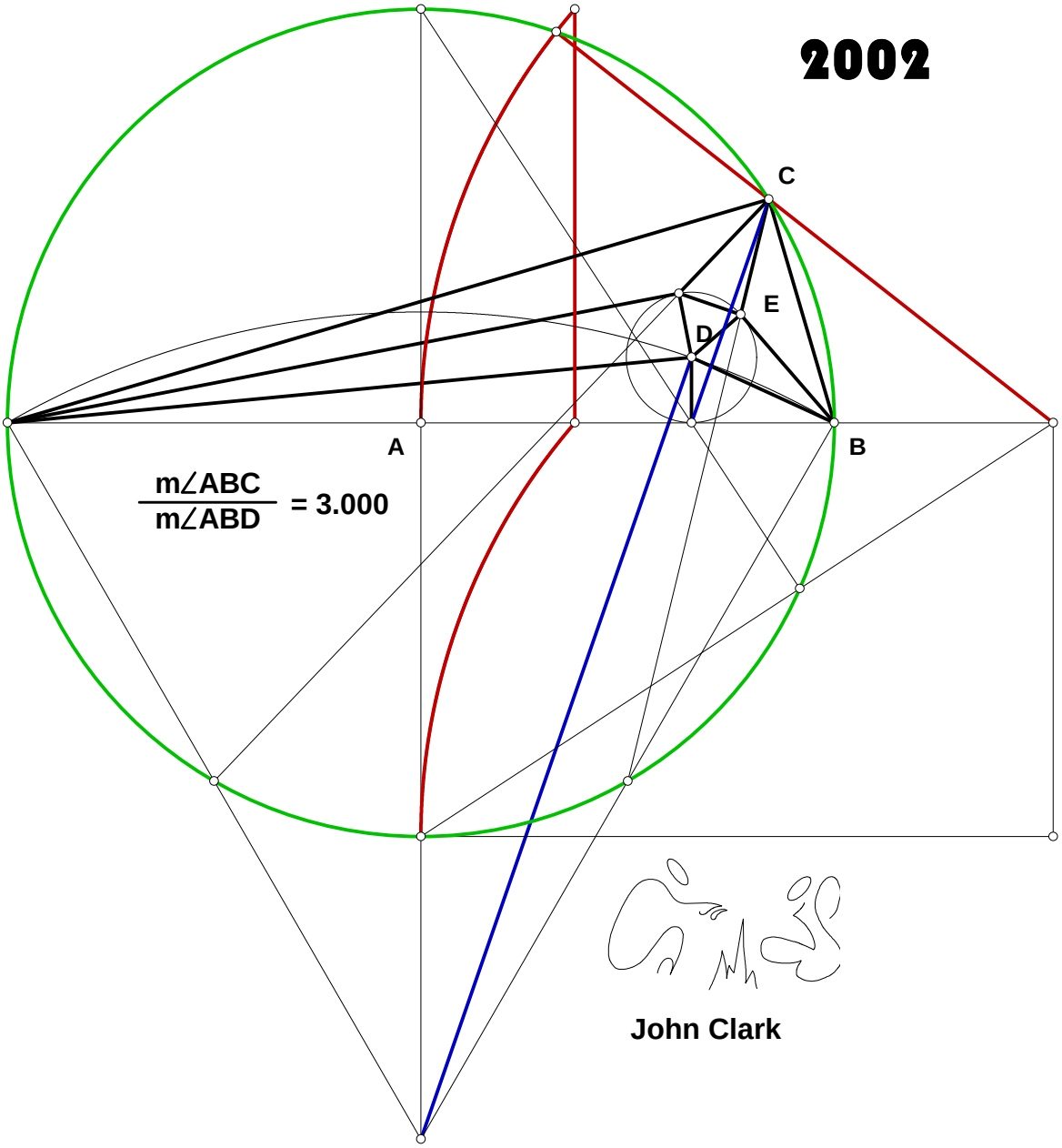
$CE := AE - AC \quad CG := \sqrt{CE^2 + EG^2}$

Some Algebraic Names:

$BC := \frac{1}{(2 \cdot N_1)} \quad AE := \frac{1}{N_2} \quad EF := 1 - \frac{1}{N_2} \quad EH := \frac{\sqrt{N_2 - 1}}{N_2} \quad EG := \frac{\sqrt{N_2 - 1}}{N_1 \cdot N_2}$

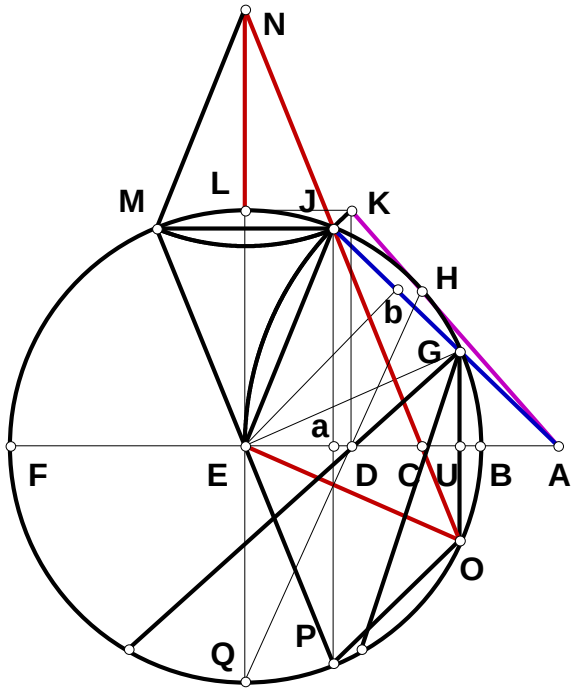
$CE := \frac{1}{N_2} - \frac{1}{2} \quad CG := \frac{1}{2} \cdot \frac{\sqrt{4 \cdot N_1^2 - 4 \cdot N_1^2 \cdot N_2 + N_1^2 \cdot N_2^2 + 4 \cdot N_2 - 4}}{(N_1 \cdot N_2)}$

Three Pieces Of Paper



John Clark

Just Another Proof Of Paper 010202



$N := 7 \quad AB := 1 \quad AF := AB \cdot N$

$BF := AF - AB \quad BE := \frac{BF}{2} \quad AE := BE + AB$

$AJ := AE \quad EJ := BE \quad Ea := \frac{EJ^2 + AE^2 - AJ^2}{2 \cdot AE}$

$Gb := Ea \quad GJ := 2 \cdot Gb \quad AG := AJ - GJ$

$Aa := AE - Ea \quad AU := \frac{Aa \cdot AG}{AJ}$

$Ja := \sqrt{AJ^2 - Aa^2} \quad GU := \frac{Ja \cdot AG}{AJ}$

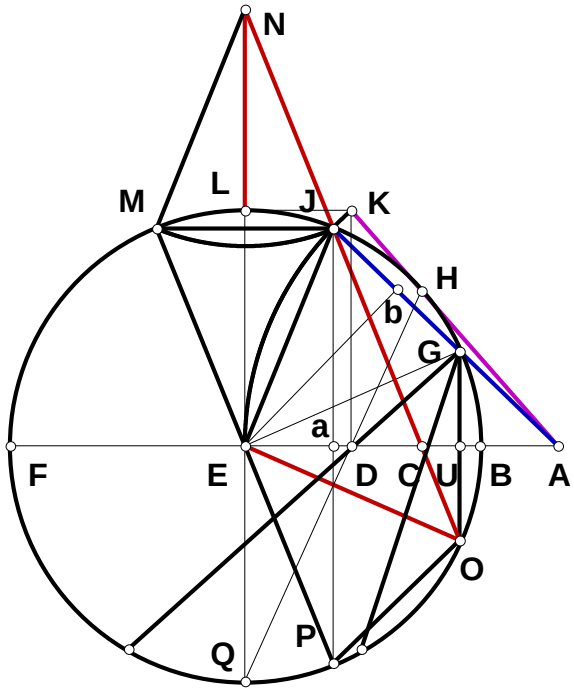
$Ua := Aa - AU \quad JO := \sqrt{Ua^2 + (GU + Ja)^2}$

$JN := \frac{JO \cdot Ea}{Ua} \quad JN - BE = 0$

From 4/29/94 $OP := \sqrt{Ja^2 - 2 \cdot Ja \cdot GU + GU^2 + Ua^2}$

$OP - 2 \cdot Ea = 0 \quad NO := JO + JN \quad EU := Ua + Ea \quad EN := \sqrt{NO^2 - EU^2} \quad EL := BE \quad LN := EN - EL$

Some Algebraic Names;



$$N - 1 - BF = 0 \qquad \frac{N-1}{2} - BE = 0$$

$$\frac{N+1}{2} - AE = 0 \qquad \frac{(N-1)^2}{4\cdot(N+1)} - Ea = 0$$

$$\frac{(N-1)^2}{2\cdot(N+1)} - GJ = 0 \qquad \frac{N^2+6\cdot N+1}{4\cdot(N+1)} - Aa = 0$$

$$\frac{2\cdot N}{N+1} - AG = 0 \qquad \frac{N\cdot\left(N^2+6\cdot N+1\right)}{(N+1)^3} - AU = 0$$

$$\frac{(N-1)\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}}{4\cdot(N+1)} - Ja = 0$$

$$\frac{N\cdot(N-1)\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}}{(N+1)^3} - GU = 0$$

$$\frac{\left(N^2+6\cdot N+1\right)\cdot(N-1)^2}{4\cdot(N+1)^3} - Ua = 0 \qquad \frac{(N-1)\cdot\left(N^2+6\cdot N+1\right)}{2\cdot(N+1)^2} - JO = 0 \qquad \frac{N-1}{2} - JN = 0$$

$$\frac{(N-1)^2}{2\cdot(N+1)} - OP = 0 \qquad \frac{(N-1)\cdot\left(N^2+4\cdot N+1\right)}{(N+1)^2} - NO = 0 \qquad \frac{(N-1)^2\cdot\left(N^2+4\cdot N+1\right)}{2\cdot(N+1)^3} - EU = 0$$

$$\frac{(N-1)\cdot\left(N^2+4\cdot N+1\right)\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}}{2\cdot(N+1)^3} - EN = 0$$

$$\frac{(N-1)\cdot\left(N^2+4\cdot N+1\right)\cdot\sqrt{(N+3)\cdot(3\cdot N+1)}}{2\cdot(N+1)^3} - \frac{N-1}{2} - LN = 0$$